

CLASS 305, WHEEL SUBSTITUTES FOR LAND VEHICLES

SECTION I - CLASS DEFINITION

This class relates to apparatus intended to be substituted for the wheel or runner of a land vehicle. The apparatus of this class bears the same general relationship to a land vehicle as a wheel or runner and serves generally the same function but is so constructed that it can be called neither a wheel nor a runner. The apparatus of the class, however, may include wheels or runners as subcombination portions thereof.

Apparatus of the class is characterized by the provision of means which facilitate the movement of the vehicle over rough terrain or increases the traction of the vehicle with respect to the ground. Devices characteristic of the class are usually known as "Steppers" or "Endless Track Apparatus".

- (1) Note. The scope of this class is limited to wheel substitutes, per se, and subcombination portions thereof and does not include the combination of land vehicles with wheel substitutes, except where the claimed combination includes only a nominal recitation of the land vehicle. For land vehicles provided with wheel substitutes see the appropriate vehicle classes as indicated in the Search Notes below.

Wherever a drawing is associated with a definition, it is merely used to illustrate the basic concept encompassed by the definition of that subclass and should not be construed as limiting the scope of the subject matter covered by that subclass.

SECTION II - REFERENCES TO OTHER CLASSES

SEE OR SEARCH CLASS:

- 59, Chain, Staple, and Horseshoe Making, subclasses 78+ for chains of general utility.
- 152, Resilient Tires and Wheels, subclasses 1+ for spring wheels, subclasses 213+ for anti-skid devices for resilient tire. Class 305 takes patents where the sole specific disclosure or a claim is to an anti-skid device which is adapted to be trained about a pair of longitudinally spaced resilient tires and intended to operate as an endless track apparatus.

- 180, Motor Vehicles, subclass 6.7 for an endless track vehicle which is steered by driving, subclasses 7.1+ for a motor vehicle driven in some other way than by the mere rotation of road wheels as traction wheels, subclasses 116+ for surface effect vehicles, subclass 164 for a motor vehicle provided with powered means for creating a fluid force to attract the vehicle to a surface of travel (neither subclasses 116+ nor 164 requiring the claiming of a propulsion means or specific vehicle structure), and subclasses 182+ for a motor vehicle which includes one or more ski-like or runner members. Class 180 (noting the specified exceptions) takes patents relating to a vehicle, disclosed as a motor vehicle where some vehicle structure or a special relationship between the vehicle frame and the wheel substitute is set forth in the claims, irrespective of whether or not any driving means is claimed. However such expressions as a "vehicle frame", "an axle", "a pivotal connection between the vehicle frame and wheel substitute carrying frame" in claims which are otherwise directed to specific wheel substitute structure are considered mere nominal recitations of vehicle structure and are not excluded from Class 305. Also Class 180 takes patents claiming some element of the driving means of a wheel substitute except that the mere broad recitation of a drive means, drive axle or drive sprocket for a wheel substitute is not sufficient to exclude the patent from Class 305, if the vehicle is otherwise only nominally recited in the claims.
- 188, Brakes, for brakes, per se. Class 305 takes the combination of a wheel substitute and brake therefor if some wheel substitute structure is claimed. The mere nominal recitation of a wheel substitute in the claims is not sufficient wheel substitute structure to be classified in Class 305.
- 198, Conveyors: Power-Driven, appropriate subclasses for endless belt conveyors.
- 244, Aeronautics and Astronautics, subclasses 100+ for an aircraft landing gear in the form of a wheel substitute. Class 305 takes wheel substitute landing gears for aircraft where no aircraft structure is claimed or where only a nominal relationship between the aircraft and landing gear is claimed.
- 280, Land Vehicles, subclass 5.22 for land vehicles provided with endless tracks especially adapted for ascending steps, subclasses 12.11 and 12.12 for land vehicles provided with a stepper run-

- ning gear and subclass 28.5 for land vehicles provided with wheel substitute ground engaging support means. To be placed in Class 280 a patent must claim some vehicle structure or more than a mere nominal relationship between the vehicle frame and the wheel substitute apparatus. For example the broad recitation of a vehicle frame, an axle, or a pivotal connection between the vehicle frame and the wheel substitute apparatus are considered mere nominal vehicle structure and a claim with these limitations would be classified in Class 305, if the claim is otherwise directed to the wheel substitute apparatus.
- 301, Land Vehicles: Wheels and Axles, subclasses 41.1+ and especially subclasses 45+ for traction increasing devices for wheels. Class 305 takes traction increasing devices in the form of plates pivotally secured to the rim of a wheel and adapted to extend in a plane parallel to the ground when in contact therewith to simulate the action of feet even though the plates are provided with ground penetrating cleats. These devices distinguish from the subject matter in Class 301, subclasses 45+ in that the traction increasing devices therein are limited to ground penetrating cleats which are movably mounted on the rim of a wheel but are not mounted on plates which are adapted to simulate the action of feet when in contact with the ground.
- 384, Bearings, appropriate subclasses for a bearings for a rotary element and particularly subclass 417 for a bearing support for an idler pulley.
- 474, Endless Belt Power Transmission Systems or Components, appropriate subclasses for power transmission belts or chains of general utility either alone or in combination with a driving sprocket, and for guides or tensioners for such belts or chains. Class 305 takes a patent for a flexible track and wheel combination or a flexible track or element thereof, per se, wherein the sole disclosure or a claim is to a flexible track apparatus for a land vehicle. Class 474, takes a pulley, sprocket, or guide roll, per se, even though the pulley, sprocket, or guide roll is solely disclosed for use in connection with an endless track for a land wheel.
- An annular band made either of a single piece of flexible material or of a plurality of individual treads or sections movably connected together.
- TREAD**
- A unitary ground engaging block or plate made of flexible or rigid material or a combination of both and provided with securing means for connection to similar devices to form a flexible track.
- WHEEL**
- The term “wheel” as used in connection with this class includes resilient tires, sprocket gears, rollers or any other annular members rotatable about an axis and adapted to propel a flexible track or support a portion thereof.
- SUBCLASSES**
- 1** This subclass is indented under the class definition. Apparatus comprising ground engaging feet or plates operating by a step-by-step movement during the forward travel of the apparatus.
- SEE OR SEARCH CLASS:**
- 180, Motor Vehicles, subclass 187 for a motor vehicle provided with one or more ski-like or runner members and wherein the vehicle has at least one surface-engaging propulsion element of a type which shuffles along the surface; and subclasses 8.1+ for a motor vehicle provided with a special driving device of the mechanical leg type.
- 301, Land Vehicles: Wheels and Axles, subclasses 41.1+, especially subclasses 45+ for traction increasing devices for wheels. See the class definition of Class 305 for the line between these devices and the steps of Class 305.
- 2** This subclass is indented under subclass 1. Apparatus wherein the ground engaging feet are positioned for ground engagement by cam means.

SECTION III - GLOSSARY

FLEXIBLE TRACK

- 3** This subclass is indented under subclass 1. Apparatus wherein each of the ground engaging feet are pivotally connected to a rotating support by a plurality of links.
- 4** This subclass is indented under subclass 1. Apparatus wherein the ground engaging feet or plates are movably connected to the rim of a wheel.
- SEE OR SEARCH THIS CLASS, SUBCLASS:
19, for an endless flexible track trained about a single wheel.
- SEE OR SEARCH CLASS:
301, Land Vehicles: Wheels and Axles, subclasses 44.1+ for ground engaging cleats movably secured directly to the rim of a wheel rather than to plates or feet which are movably secured to the rim of a wheel.
- 5** This subclass is indented under subclass 4. Apparatus in which the ground engaging feet are resiliently mounted.
- SEE OR SEARCH CLASS:
152, Resilient Tires and Wheels, subclasses 5+ for spring wheels.
301, Land Vehicles: Wheels and Axles, subclass 51 for spring projected ground engaging cleats movably secured to the rim of a wheel.
- 6** This subclass is indented under the class definition. Apparatus comprising a rigid track adapted to be mounted on a vehicle to travel therewith and to form the ground support therefor.
- SEE OR SEARCH CLASS:
180, Motor Vehicles, subclass 9 for motor vehicles provided with rigid portable tracks.
- 7** This subclass is indented under subclass 6. Apparatus wherein said rigid track comprises a rigid circular rim.
- (1) Note. Apparatus under this definition usually comprises a rigid circular rim and a wheel or roller within the rim, the axis of which is eccentrically positioned with relation to the axis of the rim, said wheel or roller being adapted to roll on a lower portion of the periphery of the rim.
- SEE OR SEARCH CLASS:
152, Resilient Tires and Wheels, subclasses 17+ for a spring wheel provided with a rigid annular band extending about the periphery of the wheel outside of the springs, the axis of the wheel and band being concentric.
180, Motor Vehicles, subclass 10 for rigid circular tracks provided with driving means.
384, Bearings, subclasses 586+ for a wheel structure comprising a fixed inner portion, an outer rim and antifriction elements interposed between the fixed inner portion and the rim.
- 8** This subclass is indented under the class definition. Apparatus provided with means adapting the apparatus to travel over a railroad rail.
- 9** This subclass is indented under the class definition. Apparatus comprising means for retarding the motion of or stopping the apparatus either by friction or by positive engagement of elements.
- SEE OR SEARCH CLASS:
180, Motor Vehicles, subclass 6.7 for a motor vehicle provided with a flexible track which is steered by braking the track on one side or the other of the vehicle.
188, Brakes, appropriate subclasses for brakes, per se, or a brake combined with a nominally claimed wheel substitute.
- 15** This subclass is indented under the class definition. Apparatus (1) combined with a device outside of the class definition and not provided for in other subclasses of this class or (2) so constructed that by rearrangement of its parts it may be converted from an apparatus performing a function within the class definition to an apparatus performing a distinctly different kind of function either within or without the class definition.

- (1) Note. This subclass contains, for example, patents relating to a device comprising a wheel and an endless track each contacting the ground in operative position simultaneously, (2) a device comprising a wheel having a flexible rim which can be deformed to an elliptical shape and be made to operate as a flexible track, and (3) a device comprising a wheel and a flexible track combined therewith in such a way that the wheel alone may contact the ground or by a manipulation of the parts, the flexible track may be made to contact the ground.
- (2) Note. Patents relating to wheel substitute devices (e.g., flexible tracks) disclosed as merely assembled with or substituted for a wheel or wheels to convert the wheel or wheels to a wheel substitute device are not included in this definition. See search notes below. If however the patent relates to a device in which a wheel contacting the ground and a wheel substitute means are each present at the same time the patent comes within the definition. See part (3) of (1) Note.
- SEE OR SEARCH THIS CLASS, SUBCLASS:
- 51, for an attachment to be secured to a track tread to prevent the cleats of the tread from digging into the ground.
- 124+, and 143+, for wheel substitute devices which may comprise track means associated with wheels to convert the wheels to a wheel substitute, the track means not being present in the device when the wheel is in operation so as to contact the ground.
- 187+, for a detachable ground penetrating cleat for a track tread.
- SEE OR SEARCH CLASS:
- 180, Motor Vehicles, subclasses 9.26+ for a wheel vehicle adapted to be converted into an endless flexible track vehicle.
- 19** This subclass is indented under the class definition. Apparatus comprising a flexible track mounted about the periphery of a single wheel to completely surround such wheel and be carried solely thereby.
- SEE OR SEARCH THIS CLASS, SUBCLASS:
- 4, for steppers comprising plates pivotally secured to the rim of a wheel to act as ground engaging feet.
- SEE OR SEARCH CLASS:
- 152, Resilient Tires and Wheels, subclasses 208+ for antiskid devices for resilient tires.
- 301, Land Vehicles: Wheels and Axles, subclass 42 for chain-type antiskid devices for wheels.
- 20** This subclass is indented under the class definition. Apparatus comprising a flexible track apparatus including wheels and wherein one of the wheels is positioned on top of the upper track run.
- (1) Note. For the meaning of "wheel" see the class definition.
- 33** This subclass is indented under the class definition. Apparatus comprising a flexible track apparatus including a pair of longitudinally spaced wheels, a flexible track trained about said wheels and a flexible belt interposed between and in engagement with the track and wheels to cause the track to run over the wheels.
- 34** This subclass is indented under the class definition. Apparatus wherein a portion of the apparatus is adapted to be extended or swelled with a fluid.
- SEE OR SEARCH CLASS:
- 152, Resilient Tires and Wheels, subclasses 450+ for pneumatic tires.
- 40** This subclass is indented under subclass 185. Apparatus wherein a flexible track comprises a plurality of ground engaging treads connected together by means of an elongated flexible element.
- (1) Note. Included under this definition are tracks formed of metallic treads connected together by means of ropes, metal cables or elongated metallic bands.

SEE OR SEARCH THIS CLASS, SUB-CLASS:

157+, for treads connected together by means of elongated nonmetallic straps or bands which may or may not be metal reinforced.

41 This subclass is indented under subclass 185. Apparatus in which the connecting means between the track treads includes an element having spring-like qualities to form a resilient connection.

42 This subclass is indented under subclass 41. Apparatus wherein the tread connecting means includes a transverse pin extending through a bushing made of resilient compressible material, the bushing being either vulcanized to the pin or press fitted thereon so that rotation of the pin can only be effected by torsional distortion of the bushing.

SEE OR SEARCH THIS CLASS, SUB-CLASS:

202+, for track treads connected together by means for a transversely extending horizontal connector pin.

43 This subclass is indented under subclass 41. Apparatus wherein said element is a compressible rubber-like member.

44 This subclass is indented under subclass 185. Apparatus wherein the track is especially designed to permit steering of said track while traveling over the ground.

(1) Note. The specifically designed feature to permit steering usually comprises a special relationship of the track with its ground run support to prevent disengagement of the flexible track from its supporting structure when steering, or means such as a universal connection between the track treads to prevent undue stress between track treads when steering.

SEE OR SEARCH THIS CLASS, SUB-CLASS:

34, and 157+, for tracks made of flexible nonmetallic material.

40, for tracks formed of rigid treads connected together by means of elongated flexible cables.

43, for track treads interconnected by means of a longitudinally extending rubber hinge member.

SEE OR SEARCH CLASS:

180, Motor Vehicles, subclass 6.7 for a motor vehicle with an endless flexible track which is steered by driving and subclasses 9.44+ for a motor vehicle with an endless flexible track which is provided with steering means.

45 This subclass is indented under subclass 185. Apparatus wherein the connection between the individual track treads is such as to allow the distance between adjacent treads to be selectively increased or decreased.

46 This subclass is indented under subclass 185. Apparatus in which the track treads are provided with a spring or rubber biased ground engaging portion.

47 This subclass is indented under subclass 185. Apparatus in which means are provided on the track treads to prevent the track from flexing in one direction.

48 This subclass is indented under subclass 47. Apparatus in which said means includes outstanding projections on each track tread which projections coact to prevent flexing of the track in one direction.

49 This subclass is indented under subclass 48. Apparatus in which means are provided for connecting adjacent outstanding projections together for limited relative movement.

50 This subclass is indented under subclass 185. Apparatus wherein the treads are provided with interengaging fastening portions formed either integrally therewith or preassembled thereto so that adjacent treads may be secured together without the addition of a separate connecting or fastening member.

SEE OR SEARCH CLASS:

160, Flexible or Portable Closure, Partition, or Panel, subclass 235 for adjacent panels secured together by means

of interengaging curled or bent side edges on the panels.

- 51** This subclass is indented under subclass 185. Apparatus comprising an attachment secured to a track tread to prevent ground penetrating cleats on the track tread from cutting into a road surface.

- 52** This subclass is indented under subclass 185. Apparatus wherein a track tread has an anti-friction roller means mounted thereon adapted to contact a track supporting frame or wheel, or adapted to form the ground engaging portion of the track.

SEE OR SEARCH THIS CLASS, SUB-CLASS:

122, for a frame carried track provided with roller antifriction means.

- 53** This subclass is indented under subclass 185. Apparatus in which a complete track tread is formed in one piece.

- (1) Note. To be classified under this definition the complete tread as finally assembled to form the track must be made in one piece, either cast, molded, machined or bent into shape from a single piece of sheet metal.

SEE OR SEARCH THIS CLASS, SUB-CLASS:

47+, for one-piece treads provided with means to prevent track sag.

50, for one-piece treads which are adapted to be secured to each other without the use of separate fasteners.

157+, for molded rubber-like treads.

- 59 Including noncylindrical or hollow connector pin:**

This subclass is indented under subclass 202. Apparatus wherein at least a portion of the cylindrical element has a cavity or opening formed thereon or has a surface which is not circular in cross section.

- (1) Note. The noncircular portion of the pin must be a part thereof which engages within a bearing portion of the parts to be connected, and not merely the head of the pin.

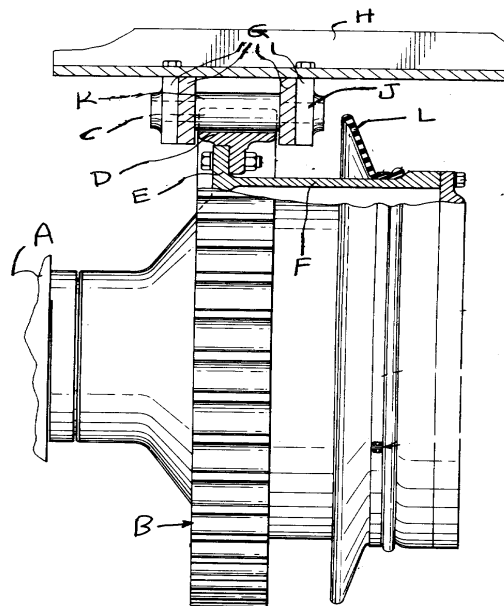
SEE OR SEARCH THIS CLASS, SUB-CLASS:

118, for a connector pin having a passage formed therein for transmitting a lubricating fluid.

- 60** This subclass is indented under the class definition. Apparatus not provided for in any of the above subclasses.

- 100 WITH MEANS TO REMOVE OR EXCLUDE FOREIGN MATTER (E.G., SEAL, SCRAPER):**

This subclass is indented under the class definition. Apparatus including a seal, scraper, guide, or shroud to expel or prevent the entry of dirt or other outlying object from any part of the apparatus.



A - Main frame; B - Drive sprocket; C - Teeth; D - Segment; E - Hub flange; F - Hub; G - Interconnected links; H - Track shoe; J - Pin; K - Intermediate bushing; L - Annular shroud or guard

SEE OR SEARCH THIS CLASS, SUB-CLASS:

122, for a track carried roller antifriction means.

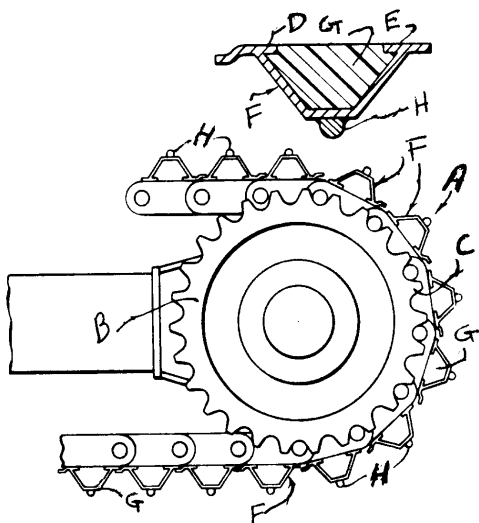
167+, for a metallic embedded reinforcement including snowmobile clip.

SEE OR SEARCH CLASS:

- 74, Machine Element or Mechanism, subclasses 608+ for a guard for a rotary member.
- 180, Motor Vehicles, subclass 84 for a dust guard in general.
- 184, Lubrication, subclasses 15.1+ for a belt, cable, chain, or conveyor lubricator.
- 277, Seal for a Joint or Juncture, for a generic sealing means or process.
- 280, Land Vehicles, subclasses 855+ for a wheel scraper or cleaner.
- 474, Endless Belt Power Transmission Systems or Components, subclass 92 for a cleaning device for a belt, pulley, or guide roll in general.

101 With means between track links or shoes:

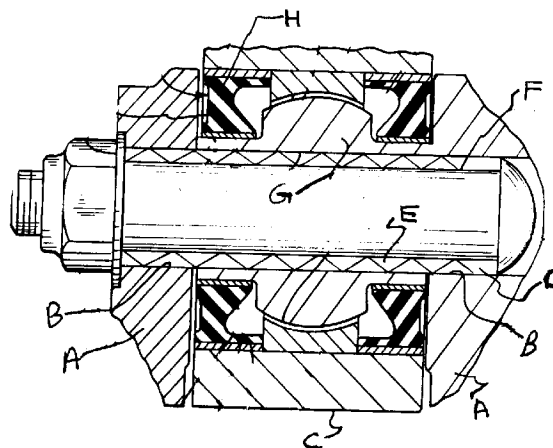
This subclass is indented under subclass 100. Apparatus including means integral or made separately to present a sealed outer surface both when in a horizontal position or when in a curved position, thereby preventing the undesirable ingress of foreign matter between the tread segments.



A - Chain track; B - Sprocket wheel; C - Sprockets; D, E - Chain plate; F - Cleat having same thickness as chain plate; G - Opening filled with elastomeric material ; H - Projecting pieces for improved traction

102 With peripheral seal between bushing and track link:

This subclass is indented under subclass 100. Apparatus including a waterproof and dust-proof elastomeric ring or similar element located on each side at or near the surface of the sleeve around the connecting pin.



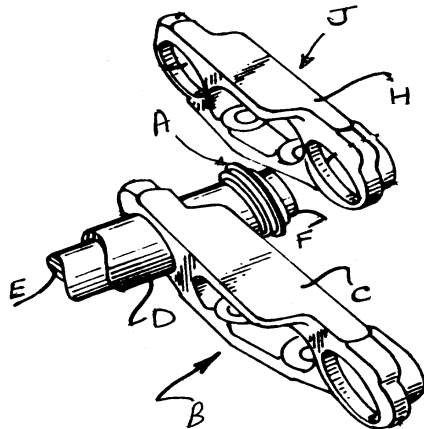
A, B, C - Track shoe collars; D, E, F - Track pin assembly; G - Spherical bearing; H - Elastomeric seal

SEE OR SEARCH CLASS:

- 384, Bearing, subclasses 13+ for a rotary plain bearing having a specified seal.
- 474, Endless Belt Power Transmission Systems or Components, subclass 207 for a positive drive belt formed of rigid links having a nonmetallic part.

103 With end seal between bushing and track link:

This subclass is indented under subclass 100. Apparatus including a waterproof and dust-proof elastomeric ring or similar element located at the outermost section to engage the removable sleeve of metal or other material joining the two inflexible belt components.



A - Seal assembly; B - Inner link; C - Main body portion; D - Track pin bushing; E - Track pin; F - Track pin outer end portion; H - Main body portion; J - Outer link

SEE OR SEARCH THIS CLASS, SUB-CLASS:

117+, for a distinct lubricating passage.

SEE OR SEARCH CLASS:

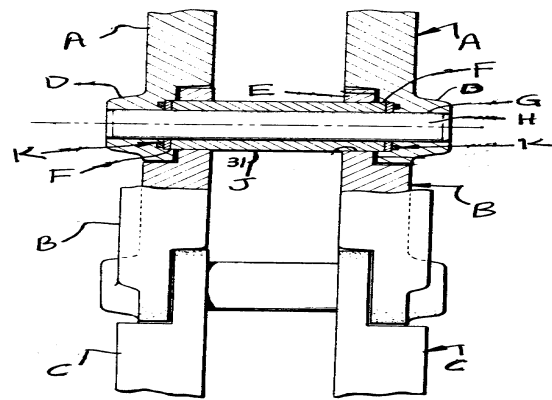
267, Spring Devices, subclasses 161+ for a ring or annular spider.

474, Endless Belt Power Transmission Systems or Components, subclass 91 for a structure facilitating lubrication of belt, pulley, or guide roll; subclass 207 for a belt formed of rigid links including a nonmetallic part; subclasses 226+ for a link including discrete members forming laterally spaced sides of opening for a pulley tooth.

104 And at connector pin:

This subclass is indented under subclass 103. Apparatus wherein the seal is located about a pivot pin which interconnects the overlapped ends of a pair of inflexible belt components.

- (1) Note. The pin connecting each pair of inflexible belt components allows flexing to enable the track to pass around the driver and idler sprockets and to accommodate unevenness of terrain.
- (2) Note. The end seal is between bushing, track, and the connector pin.



A, B, C - Upper, middle and lower links; D - Offset boss; E - Overlap; F - Counter bore; G - Central hole in offset boss; H - Pin; J - Bushing; K - Seal

SEE OR SEARCH THIS CLASS, SUB-CLASS:

42, for a torsion bushing between the pin and the track link.

47+, for a track or tread having a sag prevention means.

59, for a noncylindrical or hollow connector pin.

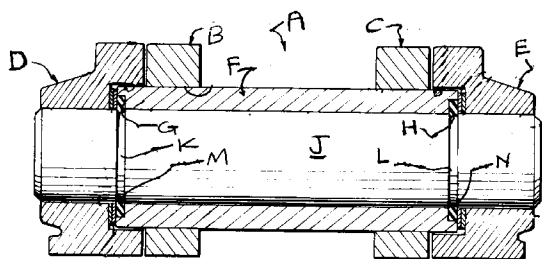
SEE OR SEARCH CLASS:

16, Miscellaneous Hardware, subclasses 380+ for means to retain a pintle in a hinge.

267, Spring Devices, subclasses 161+ for a ring or annular spider

105 With seal between connector pin and bushing:

This subclass is indented under subclass 100. Apparatus including a waterproof and dust-proof elastomeric ring or similar element located between a cylindrical element used to fasten two adjacent belt links and the removable sleeve of metal or other material.



A - Track link assembly; B, C - Pair of link members; D, E - Pair of link members; F - Bushing; G, H - Annular recess in the bushing end; portions; J - Track pins; K, L - Circumferential sealing grooves in the; connector pin; M, N - Sealing members between the bushing; and connector pin

SEE OR SEARCH THIS CLASS, SUB-CLASS:

- 102, for a peripheral seal between the bushing and track link.
- 103+, for an end seal between the bushing and track link.
- 106, for a seal between the connector pin and track link.

SEE OR SEARCH CLASS:

- 474, Endless Belt Power Transmission Systems or Components, subclass 207 for a positive drive belt formed of rigid links and having a nonmetallic part.

106 With seal between connector pin and track link:

This subclass is indented under subclass 100. Apparatus wherein the dustproof and waterproof elastomeric element is located between a usually cylindrical element used to fasten the two inflexible belt components and the recess formed in one of the two belt components itself.

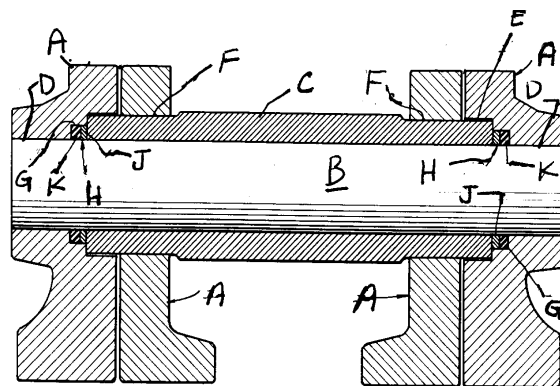
SEE OR SEARCH THIS CLASS, SUB-CLASS:

- 103+, for a seal between bushing and track link.

SEE OR SEARCH CLASS:

- 74, Machine Element or Mechanism, subclasses 18+ for a flexible sealing diaphragm attached to a moving rod and to a casing.

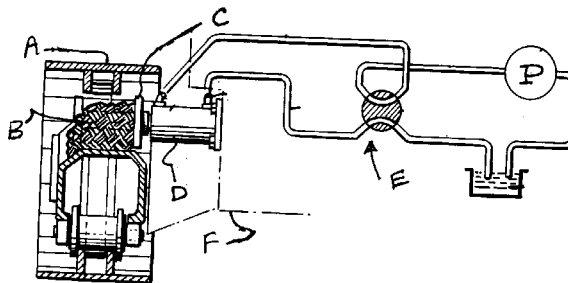
- 384, Bearings, subclass 138 for a unitary bearing and seal; and subclass 256 for an adjustable roller end support.
- 411, Expanded, Threaded, Driven, Headed, Tool-Deformed, or Locked-Threaded Fastener, subclass 353 for a securing means rotatable about fastener element and having opposed ramp surfaces; and subclass 517 for a resilient metallic retainer ring.



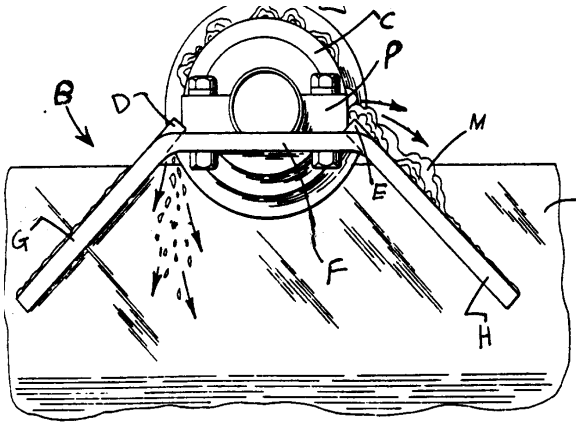
A - Side link; B - Connector pin; C - Bushing or sleeve; D - Link opening for pin; E - Annular recess in link for sleeve; F - Link opening for sleeve; G - Annular recess in link for seal; H - Seal assembly; J - Seal ring; K - Annular resilient member

107 With deflector plate, track guide means, or scraper:

This subclass is indented under subclass 100. Apparatus including a smooth, usually nearly flat and relatively thin piece of metal or other material or a single or plurality of a set of teeth or blades to push or expel the accumulated dirt, to prevent dirt and debris from entering the elements, or to maintain the surface clean of mud and rocks and having a contrivance with a directing edge, surface, or channel for maintaining the tracks on wheels.



A - Track; B - Dirt, mud; C - Pusher plate supported by hyd. cylinder; D - Hydraulic cylinder; E - Hydraulic control mechanism for pusher plate; F - Main frame



A - Side frame; B - Scraper assembly; C - Support roller of upper track section; D, E - Scraper teeth; F - Bridge section; G, H - Side wing sections; M - Mud; P - Pillow blocks

SEE OR SEARCH THIS CLASS, SUB-CLASS:

15, for combined or convertible wheel substitutes.

SEE OR SEARCH CLASS:

180, Motor Vehicles, subclass 6.7 for an endless flexible track; subclass 8.7 for an endless, flexible driving device including tracks substituted for driving wheels; and subclasses 184+ for a propulsion element of endless track type.

280, Land Vehicles, subclasses 95+ for a wheel scraper or cleaner.

440, Marine Propulsion, subclasses 95+ for a flexible endless propelling means.

474, Endless Belt Power Transmission Systems or Components, subclass 92 for a cleaning device for a belt, pulley, or guide roll.

108 With deflector or guard mounted to track body:

This subclass is indented under subclass 107. Apparatus including a lug or a beveled or wedge-shaped projecting rib secured to endless belt shoe for aiding in cleaning the belt, support wheels, or vehicle undercarriage.

SEE OR SEARCH THIS CLASS, SUB-CLASS:

111+, for a self-cleaning tread or track unit.

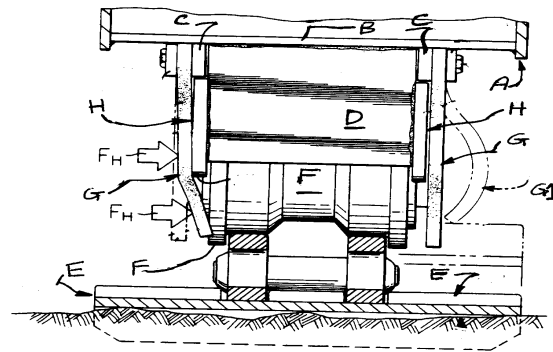
SEE OR SEARCH CLASS:

180, Motor Vehicles, subclasses 190+ for an endless track type element.

198, Conveyors: Power-Driven, subclasses 494+ for a conveyor having means to facilitate cleaning of the conveyor.

109 With deflector plate mounted to lateral side of track:

This subclass is indented under subclass 107. Apparatus including a scraper plate or a flexible guard element secured on the track roller frame or vehicle body to prevent foreign matter from entering the track area or to guide the rollers or track relative to one another.



A, B, C, D - Track roller frame assembly; E - Track assembly; F - Pair of track rollers or track links; G, G1 - Flexible guard rail; H - Backup detector plate

SEE OR SEARCH THIS CLASS, SUB-CLASS:

60, for miscellaneous subject matter.

SEE OR SEARCH CLASS:

180, Motor Vehicles, subclass 6.7 for an endless flexible track; subclass 8.7 for an endless or rotary type stepper; and subclass 9.64 for a belt- or chain-driven toothed wheel drive.

198, Conveyors: Power-Driven, subclasses 494+ for a conveyor having means to facilitate cleaning.

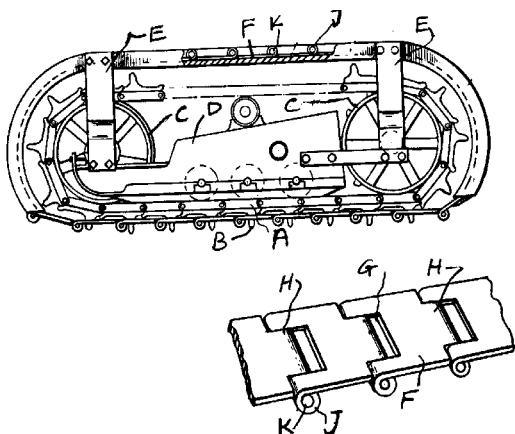
280, Land Vehicles, subclasses 855+ for a wheel scraper or cleaner.

110 With scraper mounted to scrape track or wheel:

This subclass is indented under subclass 107. Apparatus including a plate positioned on the vehicle body to remove debris from at least one surface of the drive wheels or support rollers.

111 With self-cleaning tread or track unit:

This subclass is indented under subclass 100. Apparatus including an endless chain of pivotally connected links having a notch at one end and a tongue at the other end traveling with the track unit to scrape automatically from the track shoes or other part of the vehicle any accumulation of dirt, snow, or mud.



Cleaner or cleaning chain F traverse with track to clean track A. A - Endless chain or link track; B - Track shoe; C - Sprocket wheel; D - Support frame; E - Support; F - Cleaning or cleaning link; G - Notch; H - Tongue; J - Loop; K - Pivot

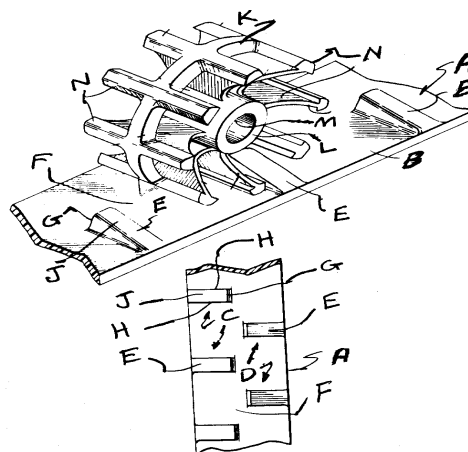
SEE OR SEARCH CLASS:

- 180, Motor Vehicles, subclasses 190+ for an endless track type element having a surface-engaging propulsion element.
- 474, Endless Power Transmission Systems or Components, subclass 901 for a pulley or guide roll for a track of an endless track vehicle.

112 Including self-cleaning endless belt:

This subclass is indented under subclass 111. Apparatus including a continuous track for automatic removal of mud, snow, and other debris.

- (1) Note. The continuous track includes at least a pair of laterally spaced driving teeth, wherein the teeth in one row are located in staggered relation to the teeth in the other row and the staggered and spaced location of the driving teeth result in automatic removal of debris.



A - Endless track; B - Belt portion; C, D - Laterally spaced rows of teeth; E - Driving teeth; F - Belt strip; G, H, J - Inner/outer teeth surface; K - Driving sprocket rim; L, M - Hub with central; N - Driving lugs

SEE OR SEARCH THIS CLASS, SUB-CLASS:

- 20, for a wheel on top of upper track run.
- 195+, for a sprocket and track engagement.

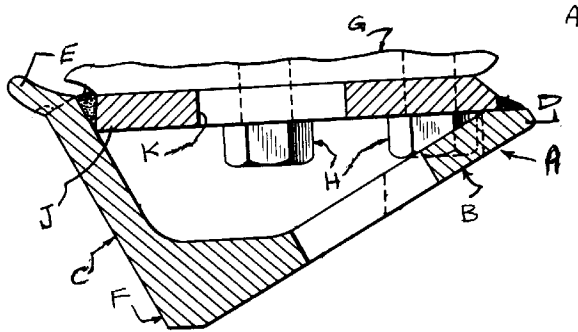
SEE OR SEARCH CLASS:

- 180, Motor Vehicles, subclasses 9.62+ for a belt or chain driven toothed wheel drive.
- 474, Endless Belt Power Transmission Systems or Components, subclass 153 for a positive drive pulley or guide roll having a particular belt; subclass 205 wherein the drive surfaces are formed integral with a continuous flexible member.

113 Having openings through side or base of shoe or link:

This subclass is indented under subclass 111. Apparatus including an endless positive track composed of individual track shoes being connected together to afford the ready passage,

discharge, or extrusion of the mud, snow, chips, and other debris.



A - Track shoe; B, C - Track shoe sidewalls; D, E - Adjacent track shoe lugs; F - Common grouser; G - Link; H - Fastening means; J - Support plate; K - Opening thru plate "J" provides egress; of entrapped debris

SEE OR SEARCH THIS CLASS, SUB-CLASS:

195, for a sprocket and track engagement.
202+, for a separate transverse connector pin between treads.

SEE OR SEARCH CLASS:

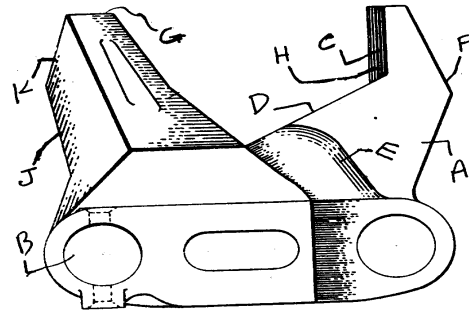
152, Resilient Tires and Wheels, subclasses 225+ for a plate or bar type antiskid device.
474, Endless Belt Power Transmission Systems or Components, subclasses 156+ for a belt formed of rigid links having sequential links pivoted about discrete pivot pin; subclasses 233+ for a positive drive belt formed of rigid links having a discrete member interconnecting pulley-tooth receiving links.

114 With particular shoe, lug, grouser structure, or material:

This subclass is indented under subclass 111. Apparatus wherein the surfaces of a metal socket or plate or a projection or ridge are formed to extend angularly with respect to the socket or ridge axis and with respect to each other, thereby squeezing or extruding mud or dirt from between the operating parts.

(1) Note. The significance is attributed to the configuration of the shoe, lug, or grouser, which facilitates cleaning or

prevents collection of mud, snow, or debris.



A - Male part of shoe or lug; B - Pin hole; C - Locking part; D - Inclined face; E - Boss; F - Flat face; G - Bridging part; H - Convex face; J - Inclined face; K - Flat face

SEE OR SEARCH THIS CLASS, SUB-CLASS:

48+, for a projecting truss type sag prevention means.
53, for a one-piece track tread.
185, for a track or tread structure in general.

SEE OR SEARCH CLASS:

152, Resilient Tires and Wheels, subclass 185.1 for an antiskid external track for a single wheel.

115

With self-cleaning sprocket or drive wheel:

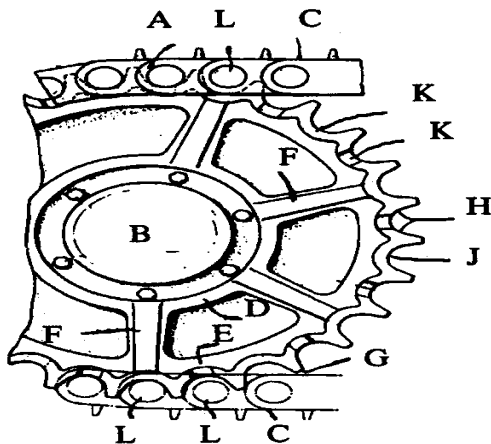
This subclass is indented under subclass 100. Apparatus wherein a circular device with a hub at the center communicating the motion is provided with relief cutouts or openings or a specific configuration to clean itself of mud and foreign substances or move such substances outwardly of the vehicle and free of endless chain.

SEE OR SEARCH CLASS:

474, Endless Belt Power Transmission Systems or Components, subclass 92 for a cleaning device for a belt, pulley or guide roll; subclass 901 for a pulley or guide roll for a track of an endless track vehicle.

116 TRACK GUIDE OR ALIGNMENT MECHANISM:

This subclass is indented under the class definition. Subject matter including an adjustment device consisting of a wheel carriage with a support arm and coupling means having a pair of plate members or similar structure to assist in correcting the proper relative position of the endless ground engaging band.



A - Sprocket wheel; B - Drive axle; C - Endless chain; D - Hub; E - Outer rim; F - Web; G - Teeth; H - Sides of teeth; J - Root face region; K - Relief cutouts; L - Bushing

SEE OR SEARCH THIS CLASS, SUB-CLASS:

153, for a longitudinally adjustable means for tensioning track.

SEE OR SEARCH CLASS:

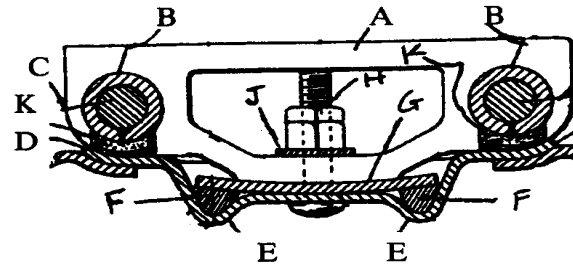
180, Motor Vehicles, subclass 9.38 for a portable endless track with a ground wheel having a steering mechanism; subclass 9.52 for an adjustable track support mounted for vertical movement.

198, Conveyors: Power-Driven, subclass 806 for a revolvable means engaging a carrier belt face automatically to correct belt training deviation.

117 WITH LUBRICATION:

This subclass is indented under the class definition. Apparatus including a discrete space, channel, or troughlike receptacle filled with a substance capable of reducing friction to the

bearing and to the belt due to the deformation suffered by passing around the peripheral curve of the pulley.



A - Link bar; B - Gudgeon pin; C - Journal pin; D - Metal shoe; E - Pressed rib; F - Wooden pillow; G - Spring metal plate; H, J - Mounting means; K - Lubricant receptacle

SEE OR SEARCH THIS CLASS, SUB-CLASS:

198, and 201, for a link or shoe structure.

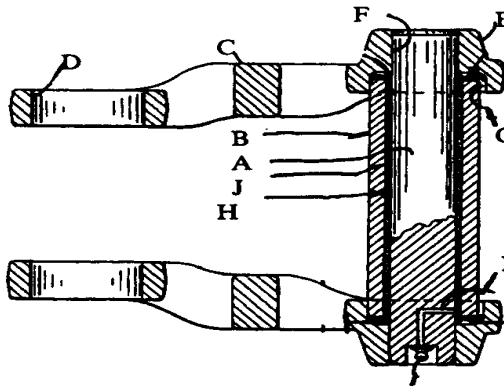
SEE OR SEARCH CLASS:

198, Conveyors: Power-Driven, subclasses 844.1+ for a carrier belt structure.

474, Endless Belt Power Transmission Systems or Components, subclass 91 for a structure facilitating lubrication of belt, pulley or guide roll; subclasses 208+ for a belt structure formed of rigid links.

118 Including passage in connector pin:

This subclass is indented under subclass 117. Apparatus wherein the lubricant is provided within the space around a metal bar interconnecting the overlapped ends of a pair of an endless chain links.

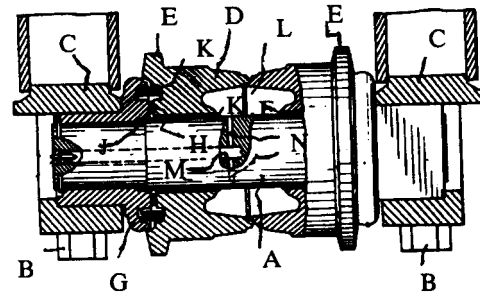


A - Link pin; B - Bushing; C - Link; D - Link opening; for bushing; E - Link outer front; F - Opening to receive link pin end; G - Annular recess; H, J - Sleeve with coils to distribute lubricant; K - Grease fitting; L - Lubricant passage

SEE OR SEARCH CLASS:

- 184, Lubrication, subclass 105.3 for a nipple or fitting type lubrication. (e.g., grease fitting)
- 277, Seal for a Joint or Juncture, for a generic sealing means or process, cross-reference art collection 907 for a passageway in a rod or shaft.
- 384, Bearings, subclass 138 for a unitary bearing or seal; subclass 282 for a special sleeve or liner with a bearing surface insert
- 403, Joints and Connections, subclass 152 for articulated members with a pivoted pin.
- 474, Endless Belt Power Transmission Systems or Components, subclass 91 for a structure facilitating lubrication of a belt, pulley, or guide roll.

- 119 Including passage in or for roller structure:**
This subclass is indented under subclass 117. Apparatus wherein the lubricant space or channel is provided within or for an endless track cylinder assembly mounted on the track frame intermediate the track sprocket and the idler wheel usually used for maintaining the lower run of the endless track in firm engagement with the underlying terrain.



A - Elongated shaft; B - Bolts to secure shaft to track frame; C - Spaced rails forming track frame; D - Roller; E - Guiding flanges; F - Bearings; G - End collars; H - Thrust washers; J, K - Seals; L - Lubricant reservoir; M - Lubricant receiving port; N - Radial bore establishes fluid communication

SEE OR SEARCH CLASS:

- 384, Bearings, subclasses 308+ for lubricating a fixed shaft with a capillary type of internal feed; subclass 418 for lubricating a rotary elongated roller.

120 WITH FRAME CARRIED ENDLESS TRACK:

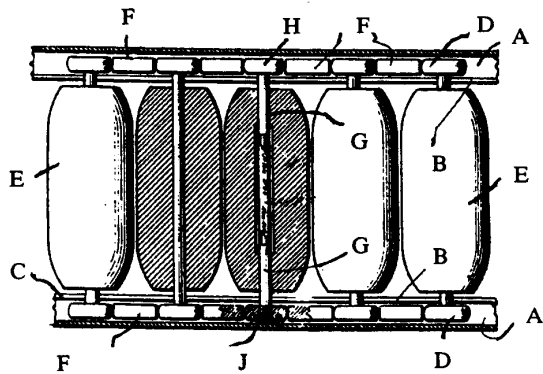
This subclass is indented under the class definition. Apparatus including a flexible continuous band guided or supported by a basic structural unit made up of a plurality of beams, plates, or angle irons.

SEE OR SEARCH CLASS:

- 180, Motor Vehicles, subclass 193 for an endless track type element with a vertically movable track support.

121 With roller antifriction means:

This subclass is indented under subclass 120. Apparatus wherein a plurality of balls or cylinders is provided between the track and the frame to facilitate movement about the frame.



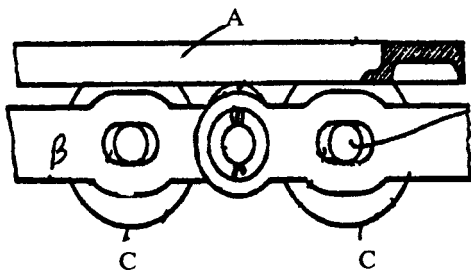
A, B, C - Frame; D - Track rollers; E - Ground engaging roller; F - Spacer; G - Axle; H, J - Axle heads

SEE OR SEARCH CLASS:

- 111, Planting, subclass 42 for an endless belt tripped hill-planting machine.
- 198, Conveyors: Power-Driven, subclass 814 for a spring biasing device for tensioning an endless conveyor belt; subclass 842 for a rotatable support, guide, or holddown means for a conveyor belt.

122 Track carried:

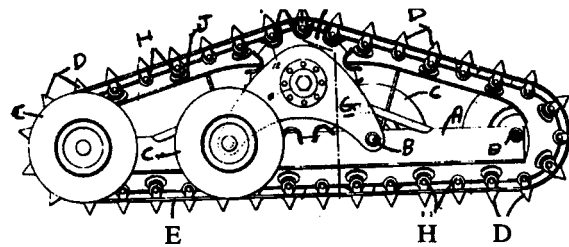
This subclass is indented under subclass 121. Apparatus wherein the rollers are attached to and carried by a continuous ground engaging band.



A - Frame; B - Endless band; C - Rollers

123 Rollers engage toothed wheel:

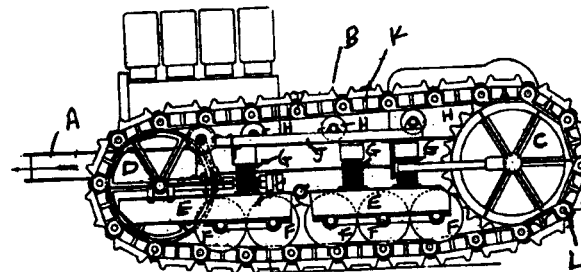
This subclass is indented under subclass 121. Apparatus wherein the ball or a cylinder of hard material contacts the sprocket wheel.



A - Rigid frame; B - Transverse axles; C - Rubber tires; D - Cleat or tread; E - Endless band; F - Sprocket wheel; G - Vertical rigid support; H - Rollers; J - Rollers

124 WITH TRACK SUPPORT INTERMEDIATE OF END WHEELS:

This subclass is indented under the class definition. Apparatus including a continuous ground engaging band having at least a pair of longitudinally spaced foremost and rearmost circular elements having a hub at the center and further including a band holding means or sag prevention means situated at the middle of the foremost and rearmost circular elements.



A - Main frame; B - Endless chain track; C - Rear wheel; D - Idler wheel; E - Roller truck frame; F - Rollers; G - Support spring; H - Guide rollers; J - Support bar; K - Links; L - Link pin

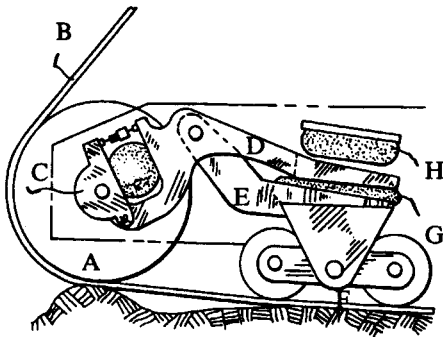
- (1) Note. Subject matter of this subclass includes means to support the upper or lower run of the endless band to maintain tension, to guide the band, or to support the vehicle and maintain contact between the lower run of the band and the ground.

SEE OR SEARCH CLASS:

- 180, Motor Vehicles, subclasses 9.5+ for an endless flexible track support mounted for vertical movement.

125 Including end wheel support for movement to maintain track tension:

This subclass is indented under subclass 124. Apparatus wherein at least one of the rearmost wheels is mounted for longitudinal adjustment to prevent slackening of the band.



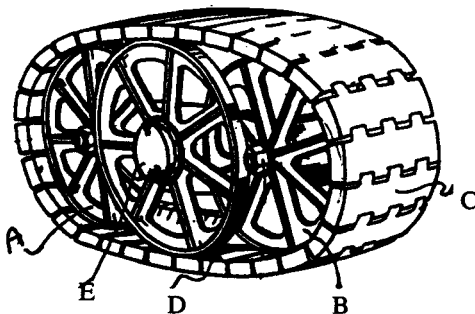
A - Endwheel; B - Endless track; C - Wheel hub; D - Support link; E - Roller link; F - Roller assembly; G - Suspension pad; H - Resilient stop pad

SEE OR SEARCH CLASS:

474, Endless Belt Power Transmission Systems or Components, subclasses 133+ for a guide roll mounted for movement of its axis along an arcuate path for tensioning the endless belt.

126 Intermediate support includes wheel contacting upper and lower track runs:

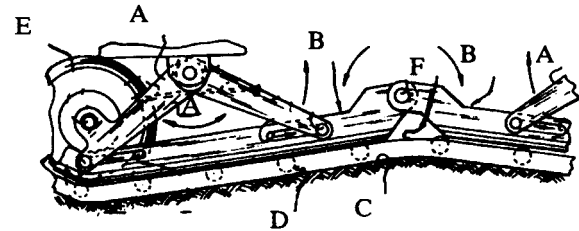
This subclass is indented under subclass 124. Apparatus wherein the holding means at the middle of the endless band includes at least one circular element touching both the top and bottom portion of the endless band.



A, B - End wheels; C - Endless band; D - Band inner face; E - Intermediate support wheel

127 Including elongated slide or frame support:

This subclass is indented under subclass 124. Apparatus including at least a pair of elongated laterally spaced means adapted to hold the vehicle on the track and keep the track in contact with the ground.



A - Link members; B - Elongated slide support; C - Ground engaging outer track surface; D - Rollers; E - Endwheel; F - Inner track surface

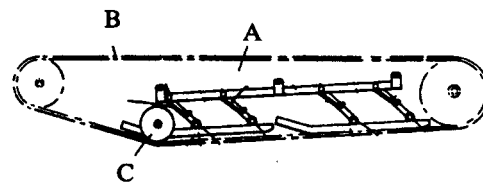
SEE OR SEARCH CLASS:

180, Motor Vehicles, subclass 193 for an endless type element with a vertically movable support located intermediate to the forward and rearward extremities of the track.

280, Land Vehicles, subclass 5.22 for a step or abutment ascending type vehicle with an endless track.

128 Combined with at least one intermediate roller:

This subclass is indented under subclass 127. Apparatus wherein the elongated slide support further includes a cylindrical element made of hard material located at the midportion of the continuous belt to hold the belt in a position away from or in addition to the slide support.



A - Elongated slide support; B - Endless track; C - Wheel or roller

SEE OR SEARCH CLASS:

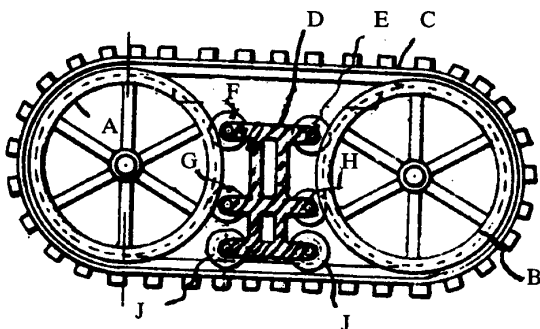
180, Motor Vehicles, subclass 193 for an endless type element with a vertically movable support located intermediate the forward and rearward extremities of the track.

129 With roller support contacting lower track run:

This subclass is indented under subclass 124. Apparatus including a holding means consisting of at least one cylindrical element engaging the bottom portion of the endless band.

130 With frame mounted rollers:

This subclass is indented under subclass 129. Apparatus wherein the holding means includes a plurality of cylindrical elements made of hard material and attached to the basic structural unit made of a plurality of beams, plates, or angle irons.



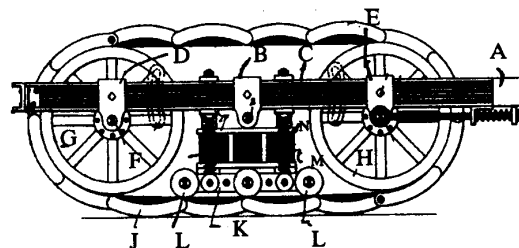
A, B - Road wheels; C - Endless band; D - Frame; E, F, G, H, J, - Rollers

SEE OR SEARCH CLASS:

180, Motor Vehicles, subclass 9.52 for an adjustable track support mounted for vertical movement.

131 Adjustable or movable frame:

This subclass is indented under subclass 130. Apparatus wherein the basic supporting structural unit is positionable from one position to another position.



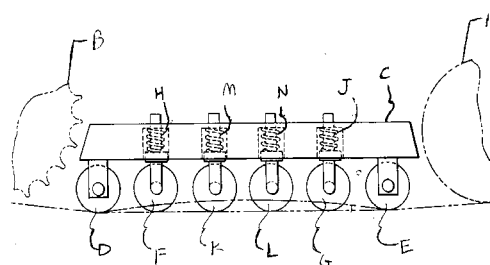
A - Vehicle main frame; B - Hub; C - Journal box frame; D, E - Journal box; F - Shaft; G, H - Wheels ; J - Endless belt; K - Roller frame; L - Rollers; M - Movable vertical rods; N - Roller frame adjusting spring

SEE OR SEARCH CLASS:

180, Motor Vehicles, subclasses 9.54+ wherein the track support mounted for vertical movement includes a spring.

132 With roller support mounted for movement individually or in pairs:

This subclass is indented under subclass 129. Apparatus wherein the cylindrical track holding means is adapted to change in its position either singularly or as a plurality of a set of two with respect to the remaining holding means.



A - Idler wheel; B - Sprocket wheel; C - Roller frame; D, E - Front rear rollers rigidly supported; F, G - Roller vertically mounted with downward biasing w/spring rate "K"; H, J - Springs w/equal spring rate K; K, L - Central rollers vertically mounted with downward biasing w/spring rate K less than K; M, N - Springs with equal spring rate K

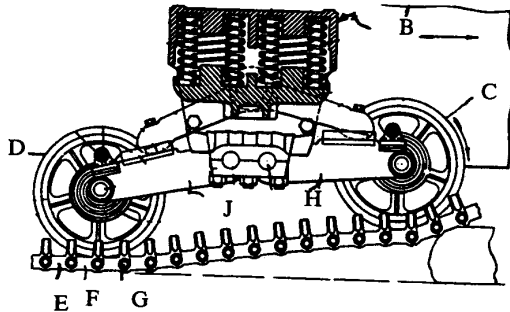
SEE OR SEARCH CLASS:

180, Motor Vehicles, subclass 9.58 for an adjustable track support mounted for vertical movement having a leaf or torsion spring; subclass 193 for an

endless track type element having a vertically movable track support.

133 Including individual roller mounted for movement at end of arm:

This subclass is indented under subclass 132. Apparatus wherein the singular cylindrical element is positioned for rotational movement at the end of a pivotable elongate member.



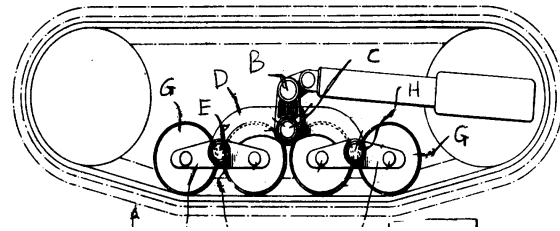
A - Vehicle body; B - Tension device; C - Front roller wheel; D - Rear roller wheel; E - Endless track; F - Track link; G - Link pin; H - Forward arm; J - Rearward arm

SEE OR SEARCH CLASS:

- 180, Motor Vehicles, subclass 9.58 for a track support mounted for vertical movement having a leaf, torsion, or coil spring.
- 280, Land Vehicles, subclass 685 for a tandem axle equalizing frame with a coil or leaf spring suspension.

134 Including walking beam or pivoting arm:

This subclass is indented under subclass 132. Apparatus wherein the track suspension mechanism includes an elongate rocking first member or members rotatably mounted at one end on a support means, and a second swingable member or members aligned with the first member or members and with the lower track of the vehicle to maintain the track in constant contact with the ground surface.



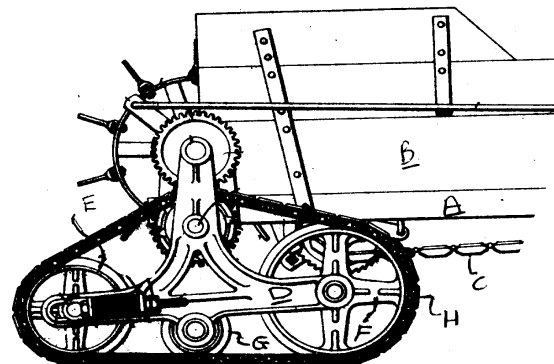
A - Endless track; B - Carrier axle; C - Trunion (pivot connection); D - Main walking beam; E - Trunion (pivot connection); F - Walking beams (secondary); G - Track rollers; H - Bearings

SEE OR SEARCH CLASS:

- 280, Land Vehicles, subclasses 677+ for a tandem axle equalized frame with a walking beam.
- 474, Endless Belt Power Transmission Systems or Components, subclass 134 for plural guide rolls engaging a single endless track; subclass 135 for a guide roll spring biased in the belt-tensioning direction.

135 With high drive arrangement:

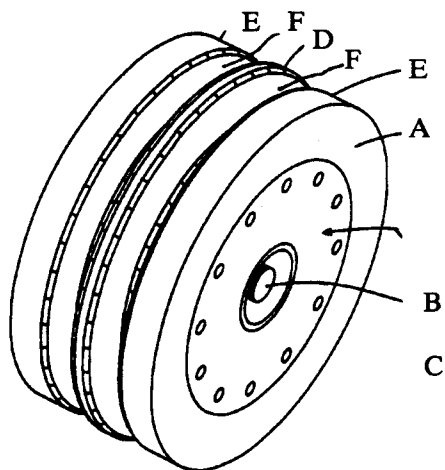
This subclass is indented under subclass 129. Apparatus wherein the lower run of the endless track is guided by the train of wheels which is being suspended by a beam and leg assembly from a journal tube such that the entire endless track unit can oscillate about the axle housing and the axle as an axis and wherein the driving wheel is arranged as the uppermost rotatable member.



A - Vehicle frame; B - Vehicle body; C - Apron; D - Frame for flanged wheels; E, F, G - Flanged wheels; H - Endless truck engaging flanged wheels

136 Specific roller structure, per se:

This subclass is indented under subclass 129. Apparatus wherein the significance is attributed to the shape or configuration of the cylindrical element.



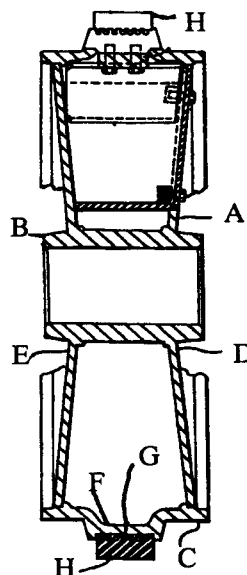
A - Roller or resilient tire; B - Rim; C - Axle; D - Central ribs; E - Load bearing surface; F - Guide grooves

SEE OR SEARCH CLASS:

- 74, Machine Element or Mechanism, subclass 572.21 for a flywheel structure.
- 152, Resilient Tires and Wheels, subclasses 17+ for a spring wheel structure, per se.
- 295, Railway Wheels and Axles, subclasses 11+ for a wheel structure, per se.
- 301, Land Vehicles: Wheels and Axles, subclass 63.101 for a specific disc type compression wheel structure, per se.
- 474, Endless Belt Power Transmission Systems or Components, subclass 177 for a friction drive pulley or guide roll; subclass 191 for a pulley or guide roll structure with a nonmetallic belt engaging surface; subclass 901 for a pulley or guide roll structure for the track of an endless track vehicle.

137 Including structure to engage track (e.g., wear surface, cushion):

This subclass is indented under subclass 136. Apparatus including specific configuration of the roller for partially contacting or meshing with the endless band.



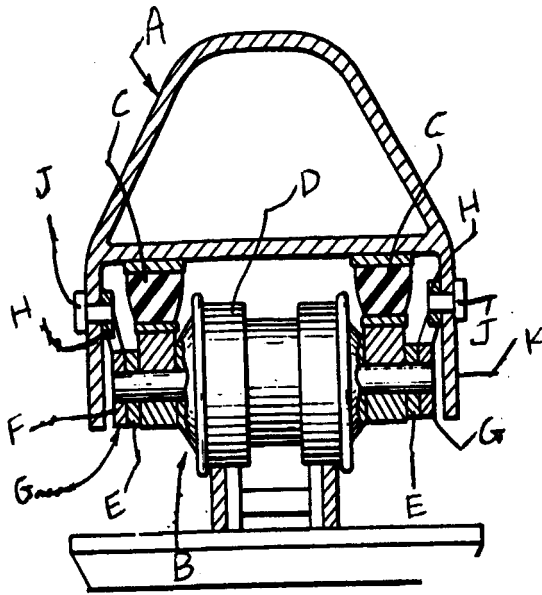
A-Roller or wheel; B-Hub; C - Rim; D,E - Wheel panels; F,G - Rim outer and inner surfaces

SEE OR SEARCH CLASS:

- 152, Resilient Tires and Wheels, subclasses 306+ for a resilient tire with a sectional abutting sections; subclass 323 for a resilient tire with a integral cushion.
- 295, Railway Wheels and Axles, subclasses 11+ for a railway wheel with a tire cushion; subclasses 31.1+ for a wheel tread.
- 301, Land Vehicles: Wheels and Axles, subclass 11.3 for detachable wheel section having a spacer between the rim and the wheel body; subclass 63.101 for a disc type compression wheel.
- 474, Endless Belt Power Transmission Systems or Components, subclass 161 for a positive drive pulley or guide roll with a nonmetallic component; subclass 164 for a positive drive pulley or guide roll having axially spaced sets of belt engaging surfaces; subclass 191 for a pulley or guide roll with a nonmetallic belt engaging surface; subclass 901 for a pulley or guide roll for the track of an endless track vehicle.

138 With roller mounting means:

This subclass is indented under subclass 129. Apparatus including the specifics of the attachment structure (e.g., clamp, pin, key) for securing the cylindrical element to the truck frame.



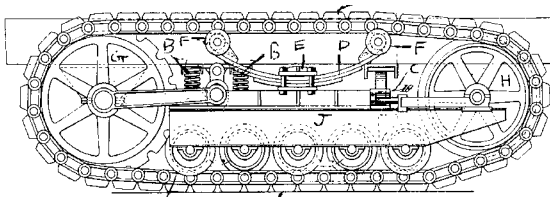
A - Truck frame; B - Roller assembly; C - Resilient cushions; D - Roller; E, F - Links to interconnect roller assembly; G - Link off set; H - Bell crank; J - Pivot; K - Truck frame side member

SEE OR SEARCH CLASS:

384, Bearings, subclasses 416+ for a plain bearing especially adapted for a pulley or roller type rotary member.

139 With intermediate upper track run support:

This subclass is indented under subclass 129. Apparatus including holding means at the middle place of the top portion of the endless band.



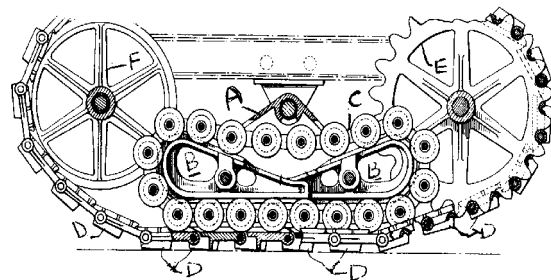
A - Endless track; B-F - Constitutes intermediate upper track run support.; G - Sprocket wheel; H - Idler sprocket wheel; J - Truck frame; K - Rollers

SEE OR SEARCH CLASS:

180, Motor Vehicles, subclass 906 for adjustable axles.

140 With endless roller chain support:

This subclass is indented under subclass 129. Apparatus wherein the holding means includes a frame as a continuous band made of individual links and further provided with cylindrical elements trained to run around the frame to extend between the frame and the lower run of the track.



A - Axle hung rocker beam; B - Runner blocks; C - Roller chain; D - Track lugs; E, F - Sprocket wheels

141 With vertically movable wheel support:

This subclass is indented under subclass 129. Apparatus wherein the holding means includes a frame and a plurality of a circular rim with a hub or a disc, capable of rotating on a central axis, mounted on the frame and being individually positionable perpendicular to the direction of the vehicle motion.

142 With plural wheel support:

This subclass is indented under subclass 129. Apparatus wherein the holding means includes two or more elements consisting of a circular rim with a hub or a disc, capable of rotating on a central axis.

143 WITH MEANS FOR TENSIONING TRACK BY MOVING AT LEAST ONE END WHEEL:

This subclass is indented under the class definition. Apparatus including a flexible endless band or belt trained about a pair of longitudinally spaced distal wheels being adjustable either in a vertical or longitudinal direction with relation to the other wheel to prevent overtightening or slackening of the band or belt.

SEE OR SEARCH THIS CLASS, SUB-CLASS:

120+, for a frame carried endless track.

125, for an end wheel support to maintain track tension.

SEE OR SEARCH CLASS:

180, Motor Vehicles, subclasses 9.5+ for an endless flexible track having an adjustable track support mounted for a vertical movement.

280, Land Vehicles, subclass 28.5 for a wheel substitute for land vehicles.

474, Endless Belt Power Transmission Systems or Components, subclasses 101+ for a tensioning means for power transmission belts; subclass 901 for a cross-reference art collection of patents on pulleys or guide rolls for the track of an endless track vehicle.

144 Condition responsive (e.g., inclination, speed, operator command):

This subclass is indented under subclass 143. Apparatus wherein the automatic adjustment of the track tension includes a system utilizing a valve in association with a track adjustment system for adjusting the track tension by providing a control for actuating the tensioner element in response to the degree of slope or rate of change of distance with time of the vehicle, or a manual signal from the operator.

145 Having hydraulic adjusting means:

This subclass is indented under subclass 143. Apparatus wherein the means for tensioning track is operated by use of a fluid in a spring mechanism to actuate a correcting movement in response to changes in the tension of the track.

SEE OR SEARCH CLASS:

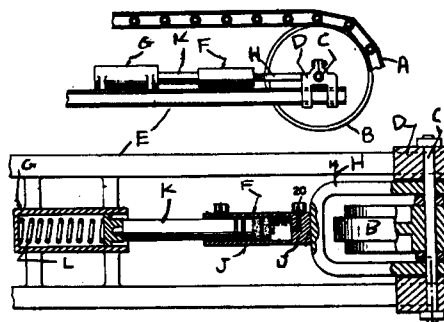
92, Expansible Chamber Devices, subclass 129 for an abutment connection working member and the power transmission device.

180, Motor Vehicles, subclass 9.52 for an additional track support mounted for vertical movement.

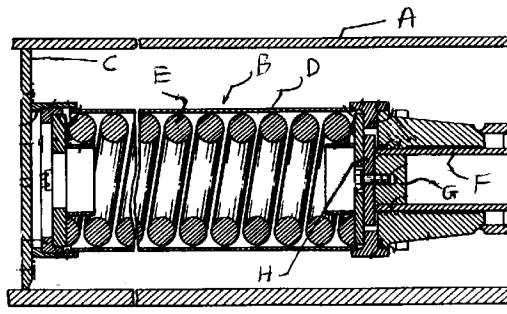
474, Endless Belt Power Transmission Systems or Components, subclass 110 for a tension adjuster driven by a fluid motor.

146 Including spring device (e.g., coil spring):

This subclass is indented under subclass 145. Apparatus wherein the hydraulic piston is provided with an additional resilient means to maintain tension of the track and allow recoil thereof.



A - Endless track; B - Idler wheel; C - Axle; D - Idler boxings; E - Frame; F - Hydraulic piston-cylinder; G - Spring unit; H - Bracket; J - Hydraulic cylinder; K - Piston rod; L - Spring



A - Track roller frame; B - Spring recoil assembly; C - Stop; D - Housing; E - Coil spring; F - Movable piston; G - Block closes piston at one end; H - Circular plate secured to piston block; (Shifting piston to the left compresses the coil spring)

SEE OR SEARCH CLASS:

91, Motors: Expansible Chamber Type, subclasses 449+ for a motive fluid valve with plural separately controlled

waste passages for a single working member.

- 92, Expandible Chamber Devices, subclass 26 for a resilient element to prevent movement of the working member; subclasses 61+ for relatively movable working members; subclass 84 for resilient means interposed between the working member and a relatively movable power transmission element; subclasses 153+ for a expandible chamber device with a lubricating means.
- 184, Lubrication, subclasses 18+ for a cylinder lubricator.
- 213, Railway Draft Appliances, subclass 43 for a fluid spring.
- 267, Spring Devices, subclass 64.11 for a vehicle spring with compressible fluid; subclasses 118+ for a expandible-contractible chamber device.
- 474, Endless Belt Power Transmission Systems or Components, subclass 138 for a guide roll spring biased in the belt-tensioning direction.

147 Coil spring housed within hydraulic cylinder:

This subclass is indented under subclass 146. Apparatus wherein the resilient element is operatively installed inside the casing of the tubular fluid chamber.

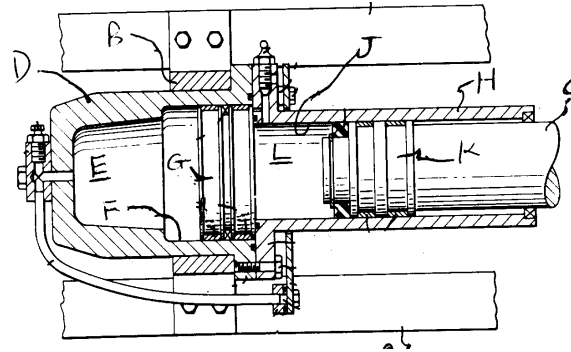
SEE OR SEARCH CLASS:

- 188, Brakes, subclass 305 for an inertia-resistance motion retarder having a piston reciprocating along the axis of oscillation; subclasses 282.8+ for a thrust member reciprocating in the enclosed chamber.
- 254, Implements or Apparatus for Applying Pushing or Pulling Force, subclass 10.5 for a metallic spring stretcher or compressor (e.g., leaf, helical, or coil spring).
- 267, Spring Devices, subclass 34 for a compound coil and fluid pressure spring; subclass 221 for a fluid retarder having a helical coil spring.

148 Including gas recoil:

This subclass is indented under subclass 145. Apparatus including a compressible fluid accumulator track system having a sudden back-

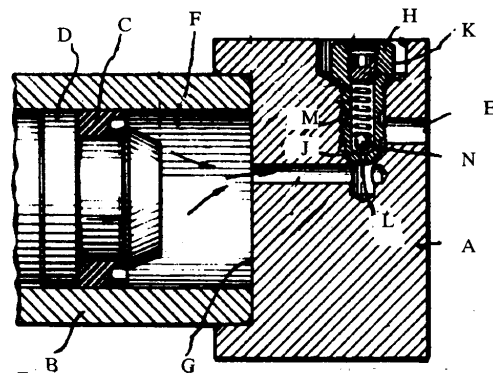
ward movement utilizing a hydraulic adjusting means to provide a differential movement connection to maintain reasonable backward movement forces over a long range of sudden backward movement.



A - Vehicle frame; B - Trunion; C - Connecting rod to yoke; D - Housing; E - Gas chamber; F - Cylinder bore; G - Free piston; H - Open-ended; J - Open-ended cylinder box; K - Piston; L - Fluid chamber

149 With vent or relief valve:

This subclass is indented under subclass 145. Apparatus including an aperture or a membranous element to allow the pressurized fluid to escape at a controlled rate from the hydraulic tensioning device.



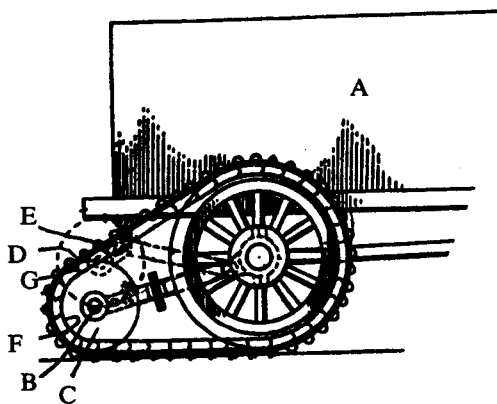
A - Cross plate; B - Track adjusting cylinder; C - Piston seal; D - Piston; E - Discharge opening; F - Piston chamber; G - Piston chamber floor; H - Safety or relief valve; J - Body sleeve; K - Integral head; L - Axial inlet passage; M - Side part; N - Ball forms second valve element

SEE OR SEARCH CLASS:

- 91, Motors, Expansible Chambers Type, subclass 168 for the control of a motive fluid for a one working member in response to the position of the second; subclasses 449+ for a motive fluid valve including plural separately controlled waste passages for a single working member.
- 137, Fluid Handling, subclasses 596 through 596.2 for systems having a valve controlled supply and exhaust, or subclasses 599.01-601.21 for systems dividing into parallel flow paths then recombining.

150 Vertically movable end wheel:

This subclass is indented under subclass 143. Apparatus wherein the adjustable distal wheel is secured in various positions not parallel to the direction of travel.



A - Rear of truck; B - Axle; C - End wheel; D - Endless belt; E - Cleat or projection; F, G - Chain made of links.
NOTE: End wheel moves vertically (shown by dotted line)

151 Biased by spring only:

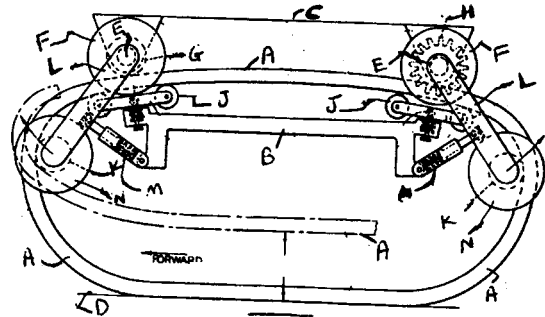
This subclass is indented under subclass 143. Apparatus wherein the endwheel is acted upon by a device capable of deflecting so as to store energy and be used as a source of power for tensioning the track.

SEE OR SEARCH CLASS:

- 280, Land Vehicles, subclass 92 for a occupant steered running gear which is one-wheel controlled.

152 Longitudinally outwardly biased by coil spring only:

This subclass is indented under subclass 151. Apparatus including a movable wheel mounted on a transverse axle movable in the direction away from the direction of travel and is acted upon by a spiral elastic element used as a source of power for tensioning the track.



A - Endless resilient band; B, C - Supports for roller; D - Terrain (ground surface); E - Shaft; F - Radial flanges; G, H - Load rollers; J - Idler roller; K, L - Floating end rollers on swingable arms; M - Coil spring mechanism; N - Radial flanges

SEE OR SEARCH THIS CLASS, SUB-CLASS:

- 44, for a steerable track or tread.

SEE OR SEARCH CLASS:

- 267, Spring Devices, subclasses 70+ for an elastic extension device such as a compression spring.
- 403, Joints and Connections, subclasses 83+ for an articulated member lockable at a fixed position.
- 464, Rotary Shafts, Gudgeons, Housings, and Flexible Couplings for Rotary Shafts, subclass 49 for a coupling device including an endless chain engaged with circumferential teeth on coupled members.

153 Longitudinally adjustable:

This subclass is indented under subclass 143. Apparatus wherein one of the distal wheels is selectively secured in various positions closer to or farther away from the other wheel.

- (1) Note. This subclass includes structure wherein an extension member is secured

to one end of a wheel carrying frame to elongate such frame.

SEE OR SEARCH THIS CLASS, SUB-CLASS:

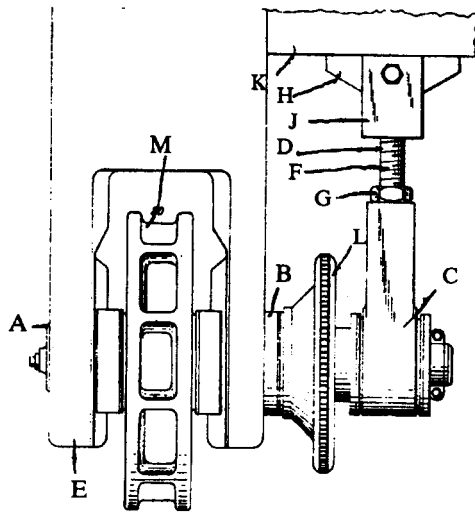
- 120+, for a frame carried flexible track wherein the frame is formed in sections which are adjustable relative to each other to maintain track tension.
- 126, wherein the intermediate support includes wheel contacting upper and lower track runs.

SEE OR SEARCH CLASS:

- 474, Endless Belt Power Transmission Systems or Components, subclasses 101+ for means for adjusting belt tension or for shifting belt, pulley, or guide roll.

154 Including threaded tension adjuster:

This subclass is indented under subclass 153. Apparatus wherein the device to change or regulate the tensile stress in the endless band includes a screw member provided with a tensile stress changing nut.



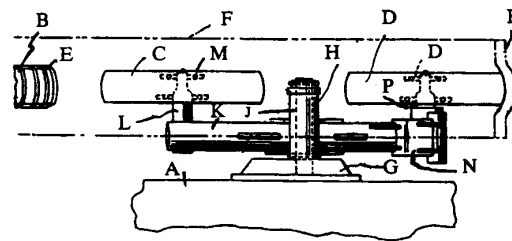
A, B, C - Journal boxes for track drive shaft; D - Adjusting device (threaded); E - Crawler beam; F - Screw member; G - Tensioning nut; H - Spherical seat; J - Shackle; K - Cross member; L - Sprocket; M - Track drive sprocket

SEE OR SEARCH CLASS:

- 180, Motor Vehicles, subclass 9.54 for an endless flexible portable track having a track support mounted for vertical movement including a longitudinally extending coil spring; and subclass 190 for a skilike runner member with one surface engaging endless track type propulsion element.
- 280, Land Vehicles, subclass 28.5 for a wheel substitute; subclass 255 for a coil spring including an adjustment for spring loading.
- 474, Endless Belt Power Transmission Systems or Components, subclass 135 and 138 for a guide roll spring biased in the belt tensioning direction.

155 With intermediate support member (e.g., linkage):

This subclass is indented under subclass 143. Apparatus including a longitudinally extending beam having an inner and outer ends and a transversely extending shaft on the vehicle connected to a midportion of the beam for supporting the beam to rock front and center wheels freely about a transverse axis.



A - Longitudinal frame; B - Rear wheel; C - Center wheel; D - Front wheel; E - Transverse grooves; F - Metal link endless track; G - Side bracket; H - Lateral rigid pipe; P, L - Fixed wheel spindle; Q, M - Bearings; N - Rigid upright

SEE OR SEARCH THIS CLASS, SUB-CLASS:

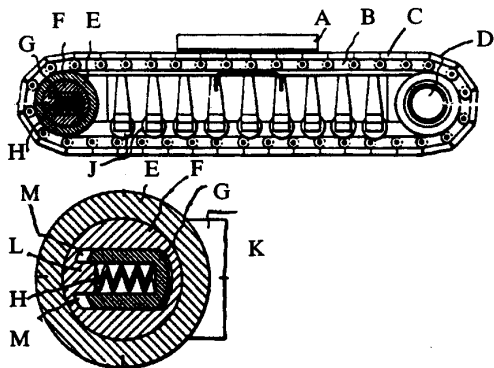
- 125, for an endwheel support for movement to maintain track tension.
- 153+, for a longitudinally adjustable tension adjuster.

SEE OR SEARCH CLASS:

280, Land Vehicles, subclass 81.1 for a multiple track running gear; subclass 679 for a running gear equalized frame with a torsion type suspension; subclass 685 for a running gear equalized frame with a coil-type suspension.

156 Tensioner contained within idler wheel:

This subclass is indented under subclass 143. Apparatus wherein the device to change or regulate the tensile stress in the endless band is provided within the device such as a circular disk or a circular rim with a hub, capable of rotating on a central axis and solely used to reverse the direction of rotation or to modify the spacing of the centers, without affecting the overall ratios of the drive.



A - Vehicle chassis; B - Endless track; C - Track shoe; D - Drive wheel; E - Idler wheel; F - Idler-wheel carrier; G - Support body; H - Tension adjustment device; J - Track roller; K - Beam; L - Pin; M - Empty space

157 ENDLESS BELT HAVING NONMETALLIC TRACK OR TREAD:

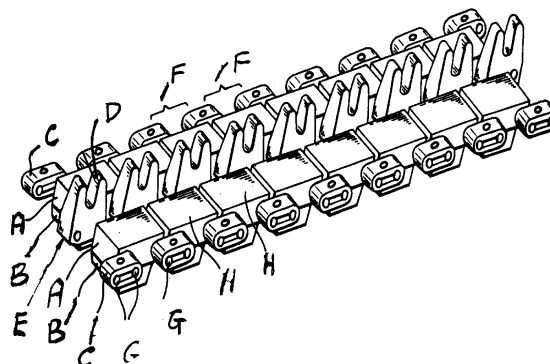
This subclass is indented under the class definition. Apparatus including a continuous band having a ground engaging surface or projection made of high strength molded plastic, Teflon, synthetic rubber, or other similar material.

158 Track formed of flexible sections:

This subclass is indented under subclass 157. Apparatus wherein the continuous band consists of a plurality of interconnected, resilient segments.

159 Track formed of rigid nonmetallic links:

This subclass is indented under subclass 157. Apparatus wherein the continuous belt is formed of inflexible components connected to each other by articulated joints presenting profiled supporting surfaces made of rubber or high strength molded plastic or similar material to permit relative movement of the components so that the belt is capable of conforming to the curvature of the pulley or sprocket drive face.



A - Tubular bodies; B - Underside running pad; C - End connector links; D - Chain tooth; E - Intermediate links; F - Successive chain links; G - Connecting pin rods; H - Roll-off surfaces

SEE OR SEARCH THIS CLASS, SUB-CLASS:

41+, for a resilient connector between treads.

SEE OR SEARCH CLASS:

198, Conveyors: Power-Driven, subclasses 698+ for a load-engaging belt having load-impelling projected cross members joined by mechanical fastening means; subclasses 850+ for a carrier belt structure formed of or including pivotally interconnected rigid links.

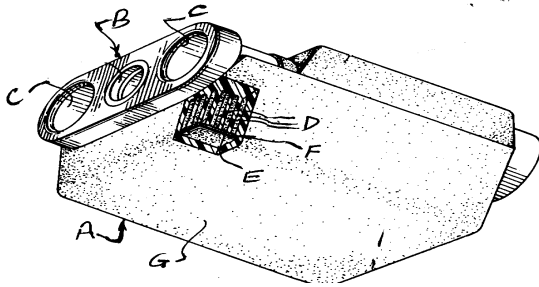
301, Land Vehicles: Wheels and Axles, subclasses 43+ for a traction increasing projecting cleat made of a resilient material.

474, Endless Belt Power Transmission Systems or Components, subclass 207 for a belt formed of rigid links including nonmetallic part; subclasses 232+ for a link including common member

forming laterally spaced sides of opening for a pulley tooth.

160 **Lug, shoe, or grouser structure, per se:**

This subclass is indented under subclass 159. Apparatus wherein the significance is attributed to the shape or configuration of the traction plate, projection, socket, or cleat, which projects from the belt.



A - Tread member; B - Metal support member; C - Mounting apertures; D, E, F - Composite molded polymeric material; G - Wear surface

SEE OR SEARCH THIS CLASS, SUBCLASS:

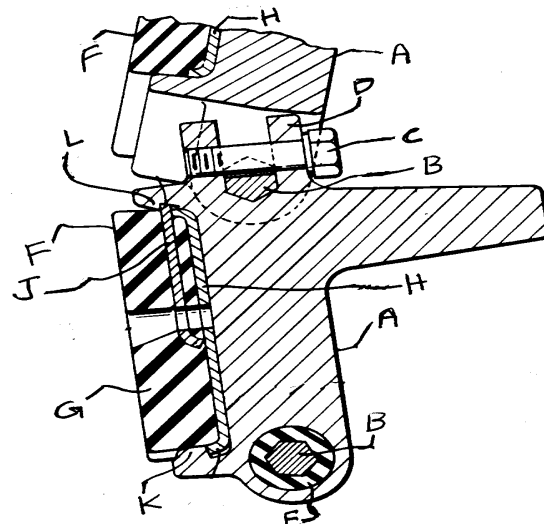
- 53, for a one-piece track tread.
- 114, for a self-cleaning shoe, lug, or grouser structure.
- 191+, for a grouser structure.
- 198, for a link or shoe structure.

SEE OR SEARCH CLASS:

- 152, Resilient Tires and Wheels, subclass 211 for an embedded antiskid tread.
- 301, Land Vehicles: Wheels and Axles, subclass 44.2 for a traction increasing projecting cleat made of a resilient material.

161 **With mounting means:**

This subclass is indented under subclass 160. Apparatus including the specifics of the attachment structure (e.g., clamp, pin, key, interlocking surface) for releasably securing a lug, shoe, or grouser.



A - Grouser plate; B - Bushing pin; C - Lock bolt; D - Bifurcated fastening plate; E - Resilient bushing; F, G - Rubberlike tread pad; H - Support plate; J - Support plate; K, L - Grouser plate lips

SEE OR SEARCH CLASS:

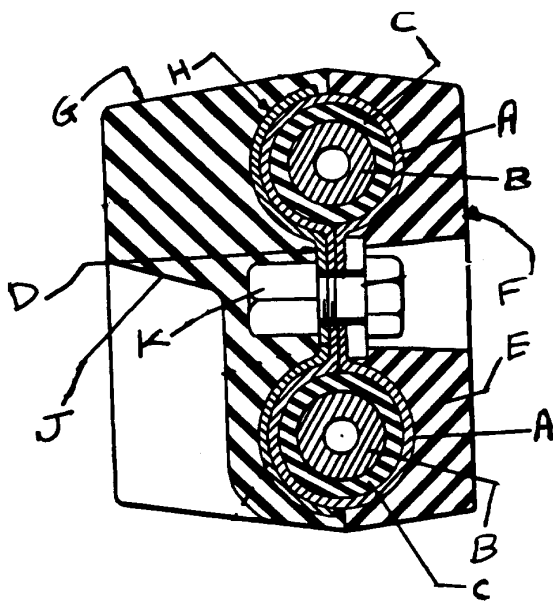
- 37, Excavating, subclasses 455+ for the specifics of the attachment structure for releasably securing a tooth or adaptor.
- 299, Mining or In Situ Disintegration of Hard Material, subclasses 91+ for a tooth mounting means.

162 **Including threaded fastening means:**

This subclass is indented under subclass 161. Apparatus wherein the securing means includes a metal collar, having an internal helical ridge, to fit a cylinder core having an outer helical ridge of approximately triangular, square, or rounded section for holding the tread pad or traction cleat firmly.

163 **With noncylindrical or hollow connector pin:**

This subclass is indented under subclass 159. Apparatus including a bridging member bridging the gap between the adjacent track links or including means consisting of parallel spaced tubularly formed pivot bearing sleeves extending transversely of the track for rigidly connecting the track shoes to the frame members.



A - Pivot bearing sleeves; B - Pivot pins; C - Rubber bushings; D - Connecting web; E, F - Rubber block with wheel contacting face; G, H - Bottom tread shoe with a metal plate "H"; J - Grouser or cleat; K - Fastening means for recurring metal plate with tread block

SEE OR SEARCH THIS CLASS, SUB-CLASS:

41+, for a resilient connector between treads.

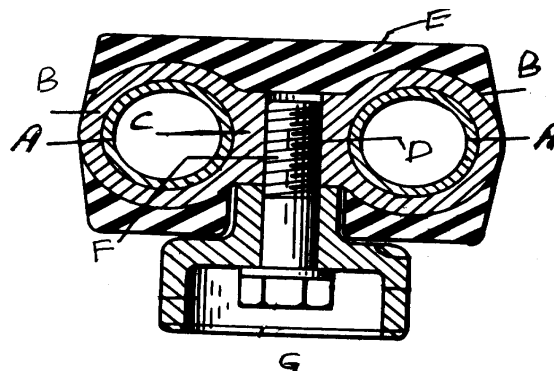
59, for a metallic noncylindrical or hollow connector pin.

SEE OR SEARCH CLASS:

59, Chain, Staple, and Horseshoe Making, subclasses 5+ for a sprocket chain making; subclasses 84+ for chain links making; and subclass 900 for a plastic chain or link making.

164 Including metal sleeve for connector pin:

This subclass is indented under subclass 159. Apparatus wherein a tubular reinforcing core made of a ductile material is incorporated within the rubber tread block or track shoe to receive a cylindrical metallic piece used for joining the track links together.



A - Tubular sleeves adapted to receive link pins and elastic bushings; B, C - End plates brazed or welded to sleeves; D - Tapped hole in the endplate; E - Electronic material abuts the track wheels; F, G - Fastening means

SEE OR SEARCH THIS CLASS, SUB-CLASS:

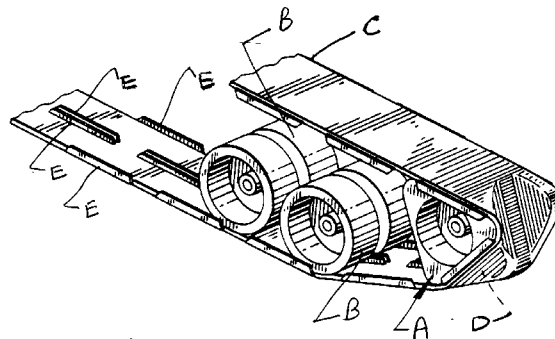
42, for a torsion bushing.

SEE OR SEARCH CLASS:

198, Conveyors: Power-Driven, subclasses 851+ wherein separate pins interconnect links of a carrier belt structure formed of rigid links.

165 Track formed of endless flexible belt:

This subclass is indented under subclass 157. Apparatus wherein the continuous ground engaging band is formed of a pliant material to permit the band to conform to the circumferential curvature of the pulley, wheel, or guide roll.



A - Drive wheel; B - Ground supporting wheels; C - Flexible belt; D - Belt shoes; E - Shoe lips

SEE OR SEARCH THIS CLASS, SUB-CLASS:

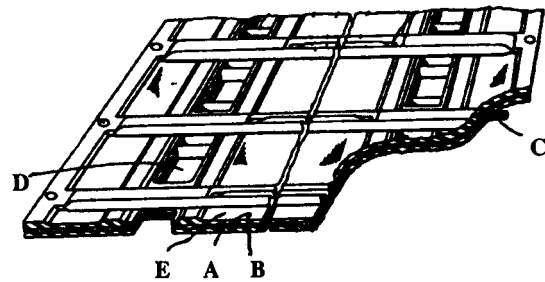
42, for a track or tread having a resiliently biased ground engaging portion.

SEE OR SEARCH CLASS:

180, Motor Vehicles, subclasses 9+ for an endless flexible portable track.

244, Aeronautics and Astronautics, subclasses 100+ for an endless track.

474, Endless Belt Power Transmission Systems or Components, subclasses 204+ for a positive drive belt wherein the drive surface on the belt is formed in or interconnected by a continuous flexible member; and subclass 253 wherein the belt is formed by interconnecting opposite ends of an elongated member.



A - Top layer; B - Bottom layer sprocket tooth; C - Metallic reinforcement; D - Hole to receive; E - Flexible belt

SEE OR SEARCH THIS CLASS, SUB-CLASS:

47+, for a track or tread having sag prevention means.

SEE OR SEARCH CLASS:

474, Endless Belt Power Transmission Systems or Components, subclass 270 for a friction drive belt wherein the belt is made of a fabric web and includes an additional layer of metallic reinforcement.

166 Including plural layers of different materials:

This subclass is indented under subclass 165. Apparatus wherein the belt includes at least two strata of distinct constituent, the constituent in one of the strata being of distinct chemical or mechanical composition than the constituent in the other of the strata.

SEE OR SEARCH CLASS:

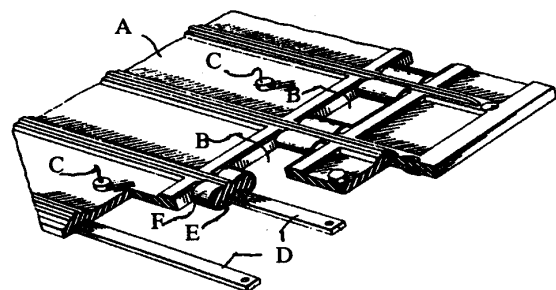
474, Endless Belt Power Transmission Systems or Components, subclass 264 for a friction drive belt wherein the belt includes at least two distinct layers of different or similar composition.

167 With metallic embedded reinforcement:

This subclass is indented under subclass 165. Apparatus including at least one element made of a lustrous, fusible, malleable, or ductile material incorporated within the flexible belt layer for additional strength.

168 Including clip for snowmobile track:

This subclass is indented under subclass 167. Apparatus wherein the inner surface of the flexible traction belt includes a plurality of longitudinally aligned hardened elements to form a low friction and reinforced region to contact or receive the elongate supporting rails of a snowmobile suspension.



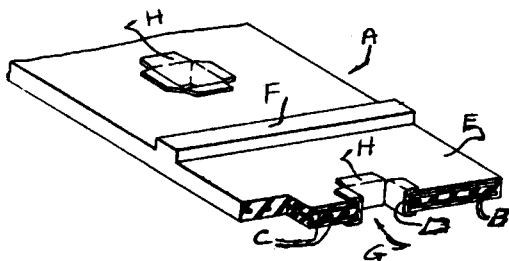
A - Traction belt; B - Sprocket wheel tooth aperture; C - Projecting studs; D - Metallic embedded reinforcement; E - Rubber bonds of traction belt; F - Additional wear clips

SEE OR SEARCH THIS CLASS, SUB-CLASS:

127, for an elongate slide or frame support.

169 Including means for sprocket tooth engagement (e.g., lug, aperture):

This subclass is indented under subclass 167. Apparatus wherein the endless belt includes spaced apertures lined with metal reinforcing clips extending through the apertures for contacting the pointed projection of the driving wheel.



A - Endless belt; B - Tension resistant nonmetallic cord; C - Metallic reinforcement; D - Sprocket receiving aperture; E - Traction surface; F - Traction lug; G - Metal clip; H - Integral clip tabs

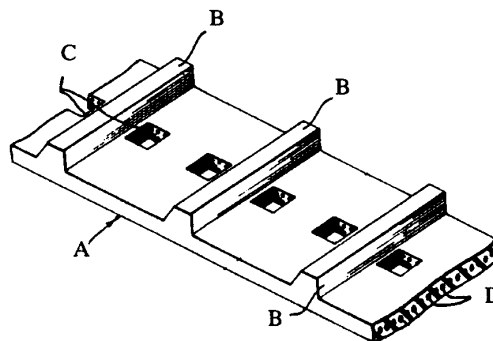
SEE OR SEARCH CLASS:

198, Conveyors: Power-Driven, subclass 834 for a carrier belt drive means including wheel with radial teeth engaging carrier belt or means connected therewith; and subclass 847 for a carrier belt structure including separate reinforcing elements.

474, Endless Belt Power Transmission Systems or Components, subclass 204 for a positive drive belt including drive surfaces on the belt formed in or interconnected by continuous flexible member.

170 Reinforcement is endless:

This subclass is indented under subclass 167. Apparatus including at least one metallic cable means formed from a continuous length looped around the continuous band track so as to form a continuous reinforcing layer.



A - Endless belt; B - Traction lugs; C - Sprocket wheel apertures; D - Endless reinforcing cable

SEE OR SEARCH CLASS:

198, Conveyors: Power-Driven, subclass 847 for a carrier belt structure having separate reinforcing elements.

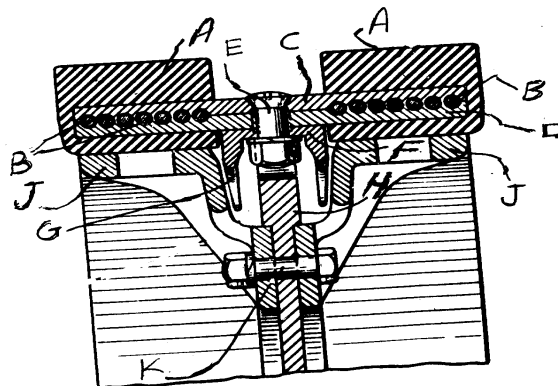
474, Endless Belt Power Transmission Systems or Components, subclasses 261+ for a friction drive belt including plural superposed layers each having strands particularly oriented relative to the belt dimension.

171 Including core bar reinforcement:

This subclass is indented under subclass 170. Apparatus wherein a plurality of spaced rigid members of uniform cross section are embedded extending transversely of the endless band.

172 With overlapping core bar sections:

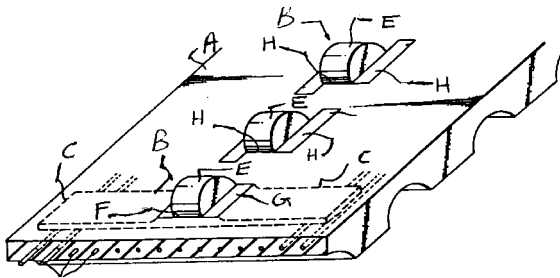
This subclass is indented under subclass 171. Apparatus wherein the rigid member having uniform cross section lies or extends partly over or upon an adjacent rigid member.



A - Endless band; B - Wire cable reinforcement; C, D - Overlapping core bars; E - Bolts for bar; F - Removable wear member; G - Integral guide plate; H - Sprocket wheel; J - Guide pulleys; K - Bolts for holding sprocket & pulley together

173 Including sprocket wheel or roller guide lug or projection:

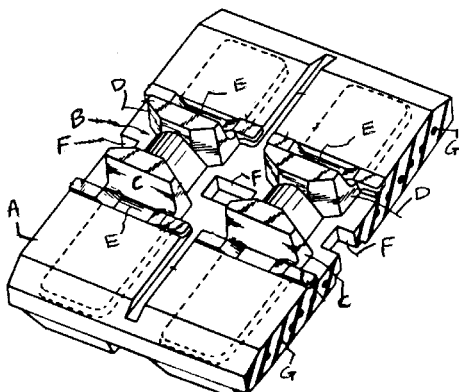
This subclass is indented under subclass 171. Apparatus including an integral piece of uniform cross section having an integral protrusion serving both for directing the motion of the track on the wheel or roller and for bracing the track against transverse movement.



A - Rubber endless track; B - Core bar; C - Core bar wing; D - Endless embedded reinforcement; E - Projection; F, G - Traveling surface; H - Traveling surface

174 Plural lugs or projections:

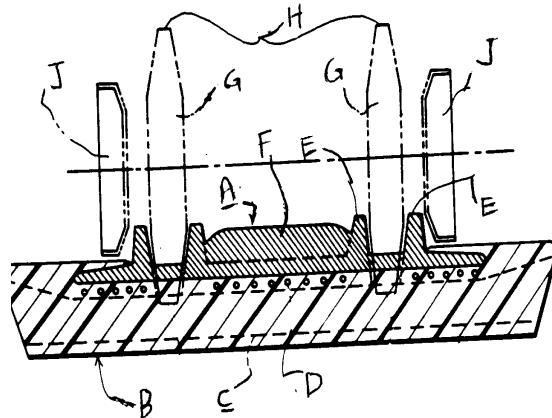
This subclass is indented under subclass 173. Apparatus including at least a pair of central protrusions formed upright in opposed relationship at predetermined intervals in the central area of each core bar.



A - Rubber belt; B - Cove bar; C, D - Pair of central projections; E - Recess; F - Sprocket tooth hole; G - Steel cord reinforcement

175 Including additional reinforcement for sprocket wheel:

This subclass is indented under subclass 174. Apparatus including at least one rib or rectangular plate extending upwardly from the core body between the protrusions and oriented perpendicularly to the protrusions for increasing the core bar strength in the area of engagement with the toothed wheel.



A - Core body; B - Rubber crawler; C - Crawler body; D - Steel cable reinforcement; E - Pair of core protrusions; F - Rib reinforcement; G - Drive tumbler; H - Sprocket teeth; J - Outer rollers

176 Portion of resilient belt overlaps core bar (e.g., roller engagement surface):

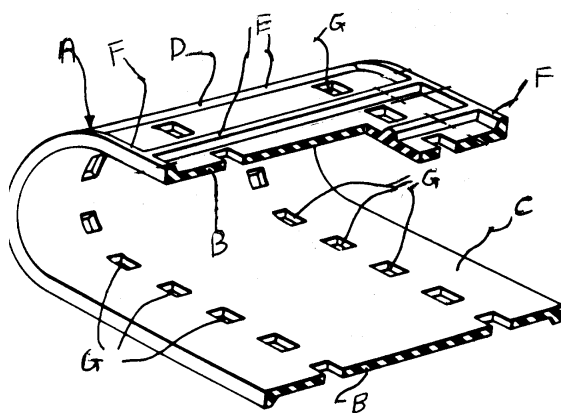
This subclass is indented under subclass 170. Apparatus wherein the area of the rigid member which supports the roller is embedded in the endless belt material.

177 Including core bar reinforcement:

This subclass is indented under subclass 167. Apparatus wherein a plurality of spaced rigid members of uniform cross section are embedded extending transversely of the endless band.

178 With integral grouser:

This subclass is indented under subclass 165. Apparatus including a plurality of stiffening members embedded in the body of the endless belt extending transversely across the width of the belt at least substantially at a right angle to the longitudinal direction to implant transverse rigidity to the belt and increase traction with the ground.



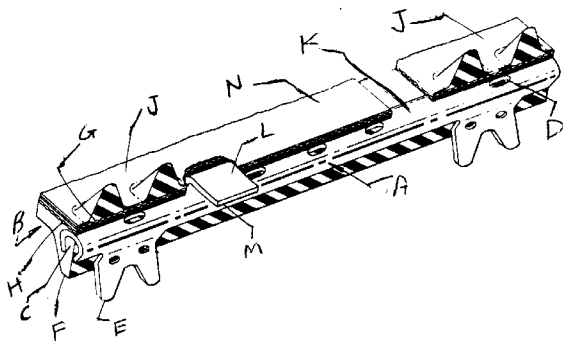
A - Belt track; B - Belt body of elastomeric material; C - Flat inner drive-contacting surface; D - Ground-contacting traction surface; E - Integral transverse grouser; F - Lateral belt raised portion; G - Sprocket teeth openings

SEE OR SEARCH THIS CLASS, SUB-CLASS:

33, for an interposed friction drive belt.

179 With reinforcement in or at grouser formation:

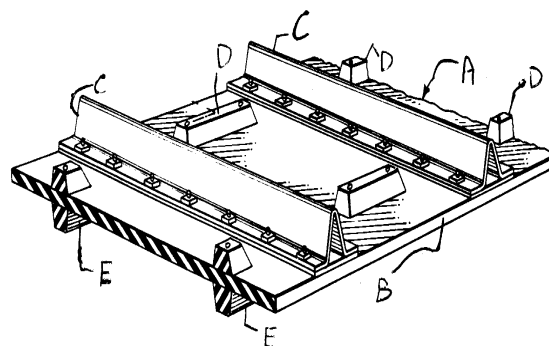
This subclass is indented under subclass 178. Apparatus including a cast-in metal beam or a separate metal beam or similar element provided adjacent the transverse rib portion to further increase the strength of the traction belt in the area of the grouser formation.



A - Transverse stiffener; B - Flexible track; C - Reinforcement; D - Stiffener perforations; E - Traction element; F - Transverse tread bar; G - Track tensile; H - Transverse reinforcement sections; J - Drive means; K - Longitudinal groove; L, M - Tab with wear resistance surface; N - Track inner surface

180 With removable lug or grouser:

This subclass is indented under subclass 165. Apparatus including a plurality of separable or changeable stiffening members extending transversely across the width of the belt at least substantially at a right angle to the longitudinal direction to impart transverse rigidity.



A - Flexible track; B - Reinforced rubber belt; C - Transverse grouser (removable); D - Skid contraction lug; E - Drive lugs

SEE OR SEARCH THIS CLASS, SUB-CLASS:

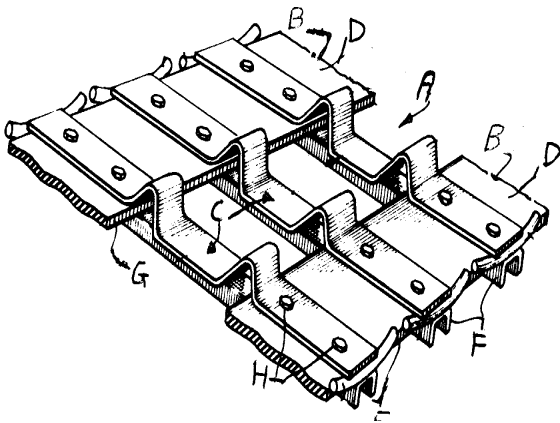
187+, for a detachable grouser for an endless chain track.

SEE OR SEARCH CLASS:

198, Conveyors: Power-Driven, subclass 698 for a load-engaging belt having load-impelling projecting cross members joined by mechanical fastening means.

181 Grouser connects plural adjacent belts:

This subclass is indented under subclass 165. Apparatus wherein the stiffening member links together more than one parallel endless bands in the transverse direction.



A - Endless track; B - Parallel rubber belts; C - Grouser bar assembly; D - Inner belt surface; E - Opposed belt outer edges; F - Outer grouser bar member; G - Spaced belt inside edges; H - Grouser mounting means

182 Including discrete connector to connect opposite belt ends:

This subclass is indented under subclass 165. Apparatus including a distinct element for joining the two distal ends of the continuous ground engaging band to create an endless loop.

183 With connecting means for reinforcing elements:

This subclass is indented under subclass 157. Apparatus including means for joining the adjacent ends of elongated strengthening elements imbedded in nonmetallic parts of the flexible track.

SEE OR SEARCH THIS CLASS, SUBCLASS:

167+, for a flexible track made of nonmetallic material and provided with embedded metallic reinforcing elements.

SEE OR SEARCH CLASS:

198, Conveyors: Power-Driven, subclasses 846+ for an endless conveyor belt structure including separate reinforcing elements.

184 With friction drive structure:

This subclass is indented under subclass 157. Apparatus wherein the belt configuration includes a motion transmitting surface or surfaces for motion transmitting engagement with

a pulley or drive wheel by motion resisting contact with the pulley or drive wheel.

SEE OR SEARCH CLASS:

198, Conveyors: Power-Driven, subclasses 844.1+ for a conveyor belt structure.
301, Land Vehicles: Wheels and Axles, subclasses 43+ for a friction increasing projecting cleat.
474, Endless Belt Power Transmission Systems or Components, subclass 167 for a friction drive belt in combination with a friction drive pulley or guide roll; and subclasses 237+ for a friction drive belt.

185

TRACKS OR TREADS:

This subclass is indented under the class definition. Apparatus comprising an annular band made either of a single piece of flexible material or of a plurality of individual sections movably connected together.

SEE OR SEARCH CLASS:

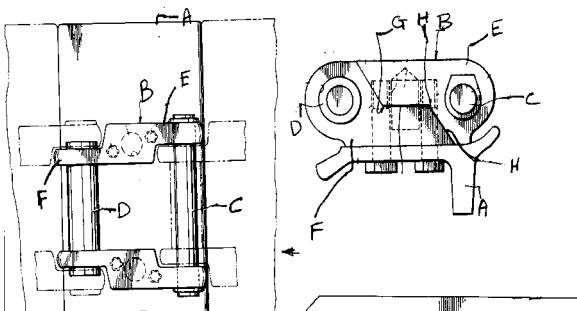
59, Chain, Staple, and Horseshoe Making, subclasses 78+ for a chain of general utility.
198, Conveyors: Power-Driven, subclasses 850+ for a conveyor belt formed of or including pivotally interconnected rigid links.
474, Endless Belt Power Transmission Systems or Components, subclasses 206+ for a positive drive belt formed of rigid links.

186

Having master link:

This subclass is indented under subclass 185. Apparatus wherein a pivotable connecting piece for connecting the endless track shoes includes two-piece part, each piece part being adapted to receive a pin and having a mating surface to couple and interlock with that of the other piece part and wherein the respective mating surfaces of the two pieces define a juncture of the master track link and each has an interlocking contact surface, these surfaces coacting to resist tensile force and thrust force exerted on the connecting piece at the pin connection of each piece part.

- (1) Note. Master link is the first link removed so that the track can be disassembled and the last to be assembled.



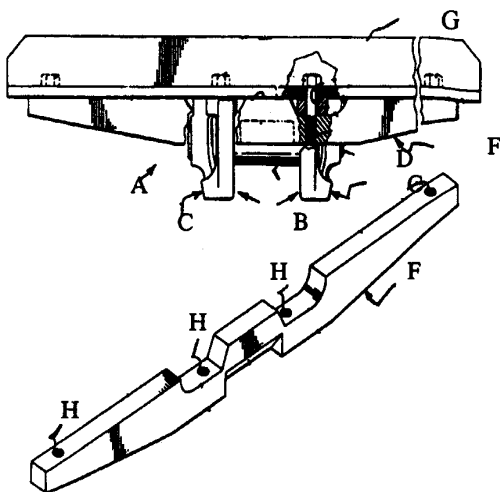
A - Track shoe; B - Master link; C - Track pin;
D - Bushing; E, F - Two-piece parts of master link;
G, H - Mating surfaces of link part E and F

SEE OR SEARCH CLASS:

- 59, Chain, Staple, and Horseshoe Making, subclass 85 for a detachable chain link.
403, Joints and Connections, subclass 294 wherein the member ends are joined by a laterally inserted section.

187 With detachable grouser for endless chain track:

This subclass is indented under subclass 185. Apparatus including a separable lateral ground penetrating cleat, stiffener, or projection for a continuous track for increasing traction.



A - Track assembly; B - Link assemblies; C - Interconnected links; D - Connector pin; E - Cylindrical bushing; F - Grouser plate; G - Track shoe; H - Mounting holes

SEE OR SEARCH THIS CLASS, SUBCLASS:

- 51, for a track or tread with a street plate.
160+, for a lug, shoe, or grouser structure for a nonmetallic endless belt.

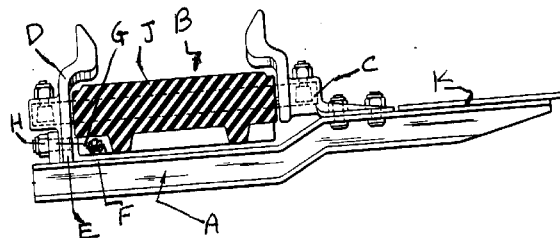
SEE OR SEARCH CLASS:

- 172, Earth Working, subclasses 91+ for a blade movable with respect to the cyclically driven carrier; subclass 100 for a blade on an endless driven belt or chain.
301, Land Vehicles: Wheels and Axles, subclasses 43+ for a traction increasing removably attached projecting cleat.

188 Including additional locking means to eliminate stress concentration:

This subclass is indented under subclass 187. Apparatus including further distinct holding means or particular configuration of the separable ground-engaging cleat which receives force and prevents excessive force on the cleat-fastening means.

- 189 Including nonmetallic part or component:**
This subclass is indented under subclass 187. Apparatus including a pad or block made of high strength rubber or other elastomeric material to reduce noise or vibration.



A - Grouser plate; B - Track (endless); C - Extended end connector (outboard side); D - End connector (inboard side); R - Flange portion; F - Grouser base portion; G -

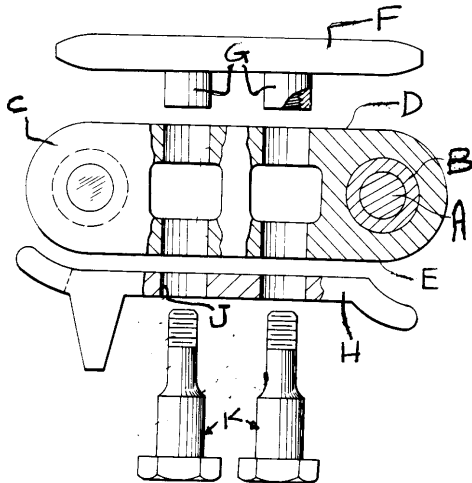
Grouser bracket; H - Bolt aperture; J - Nonmetallic block; K - Flotation plate

SEE OR SEARCH CLASS:

301, Land Vehicles: Wheels and Axles, subclass 44.2 for a traction increasing projecting cleat made of resilient material.

190 Reversible:

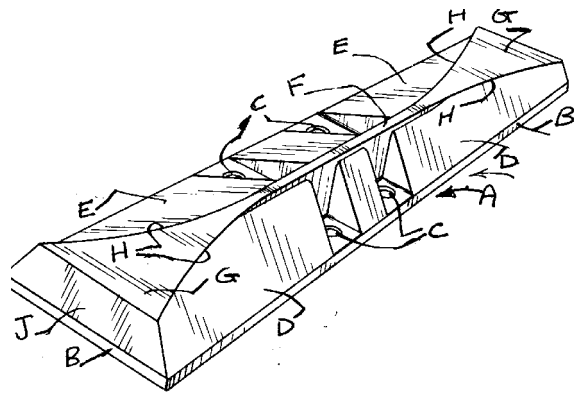
This subclass is indented under subclass 187. Apparatus wherein the grouser plate or the track shoe is rearranged to provide a new and unused ground-engaging or sprocket engaging bearing surfaces.



A - Connector pin; B - Bushing; C - Track link; D - Track link upper surface; E - Track link lower surface; F, G - Grouser plate with mounting boss; H, J - Track shoes with mounting aperture; K - Fastening means; **Note:** Grouser plate F and track shoe H are interchanged at surface E and D.

191 Grouser structure, per se:

This subclass is indented under subclass 187. Apparatus wherein the significance is attributed to the shape or components of the projecting cleat or shoe.



A - Grouser bar; B - Base of the bar; C - Bolt apertures; D - Forward planner service; E - Rearward planner service; F - Elongated track traction portion; G - Bearing surface; H - Curved edges; J - End surface

SEE OR SEARCH THIS CLASS, SUBCLASS:

53, for a one-piece track tread.

SEE OR SEARCH CLASS:

301, Land Vehicles, Wheels and Axles, subclass 44.3 and 44.4 for a traction increasing projecting cleat removably attached to a rim or to a wheel body.

192 Specific material (e.g., hardness, welding, method of manufacture):

This subclass is indented under subclass 191. Apparatus wherein the significance is attributed to the particular property or type of the basic matter from which the grouser plate is made (e.g., resistance to cutting, indentation or abrasion, process of making, process of joining the grouser plates).

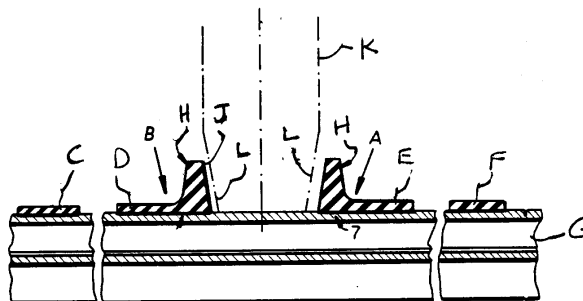
SEE OR SEARCH CLASS:

228, Metal Fusion Bonding, subclasses 141.1+ for the process of fusion bonding including shaping; and subclasses 173.1+ for the process of shaping by deforming prior to bonding.

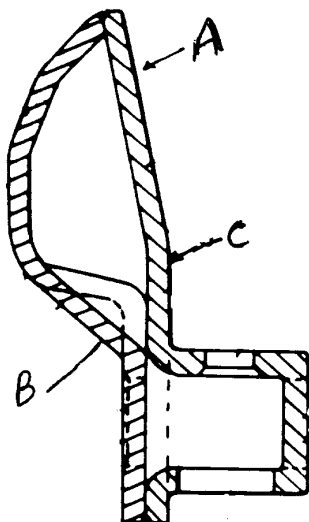
193 With guide means for interfitting with sprocket wheel or roller:

This subclass is indented under subclass 185. Apparatus including a contrivance having a directing edge, surface, channel, or projection placed face-to-face with the toothed wheel or a hollow flanged drum or a device usually made

of metal and attached to the track shoe for engaging the drive wheel or the idler wheels.



A, B - Lateral guide elements; C, D, E, F - Endless belt; G - Track bar; H - Cleat or projection; J - Flank coincides with drive roller flank; K - Drive roller; L - Drive roller flank



A - Guide assembly; B - Guide section; C - Drive section

SEE OR SEARCH THIS CLASS, SUBCLASS:

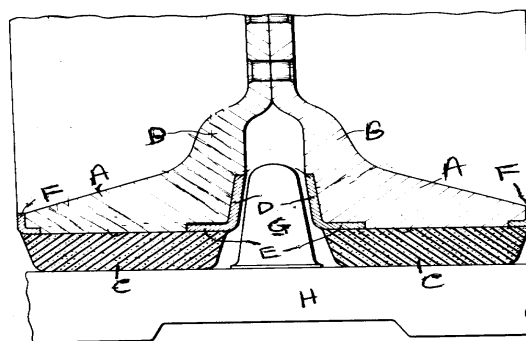
- 48+, for a truss-type tread provided with means adapted to interfit with a supporting wheel.
- 126, wherein the intermediate support includes wheel contacting upper and lower track runs.

SEE OR SEARCH CLASS:

- 198, Conveyors: Power-Driven, subclass 840 for a support, guide, or hold down means for a carrier belt wherein the guide exerts a lateral force on a non-load supporting belt surface.
- 301, Land Vehicles: Wheels and Axles, subclasses 1+ for a combined wheel and axle modification including cushioned lateral thrust.

194 Track wheel wear protection (e.g., track element protection):

This subclass is indented under subclass 193. Apparatus including usually a guard ring to serve as a guard for the track tire against contact with the guide lugs and to protect against the deterioration due to frictional contact.



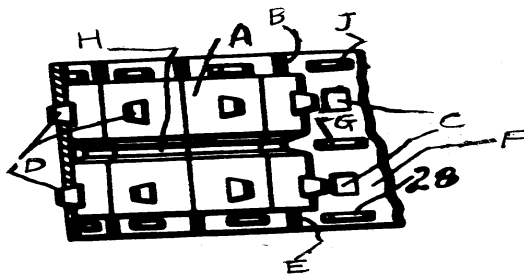
A, B - Wheel rim; C - Tire; D, E, F - Wear protective rings; G - Guiding tooth; H - Track chain

SEE OR SEARCH CLASS:

- 474, Endless Belt Power Transmission Systems or Components, subclasses 190+ for a friction drive pulley or guide roll including a nonmetallic belt-engaging surface portion.

195 Sprocket and track engagement:

This subclass is indented under subclass 193. Apparatus wherein the cooperating interengaging means to retain track and toothed wheel in position includes an inwardly extending lug or guiding mandrel or guiding jaws adapted to be received by the wheel tooth spaces.



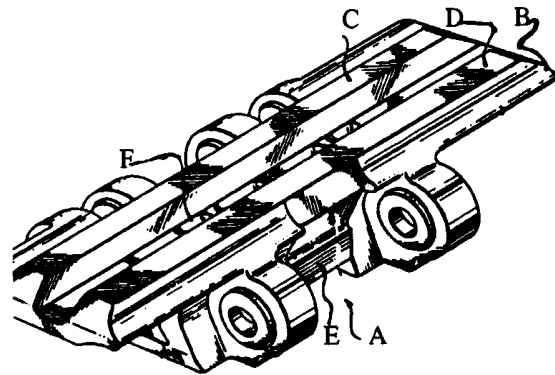
A - Sprocket wheel; B - Endless track; C - Spaced aperture (for tooth); D - Sprocket tooth; E - Interconnected chain eye pieces; F - Underside of track plate; G - Projecting lugs; H - Groove to fit toothed width; J - Additional lugs (underside of track plate)

SEE OR SEARCH CLASS:

- 74, Machine Element or Mechanism, subclass 443 for rotary bodies with sound-deadening means.
- 180, Motor Vehicles, subclass 9.62 for an endless flexible toothed wheel drive; subclass 192 for plural endless tracks with interconnected drive or support means.
- 198, Conveyors: Power-Driven, subclass 834 for an endless conveyor including wheel with a radial teeth-engaging carrier belt.
- 280, Land Vehicles, subclass 28.5 for wheeled substitute for a land vehicle.

196 Track formed of rigid links:

This subclass is indented under subclass 195. Apparatus wherein the continuous ground engaging band is formed of inflexible components connected with each other by articulated joints presenting profiled supporting surfaces to permit relative movement of the components so that the band is capable of conforming to the curvature of the sprocket drive face.



A - Rigid link; B - Traveling mechanism plate; C, D - Nonskid slipproof studs; E - Face engages with sprocket wheel tooth face; F - Recess to make link lighter

- (1) Note. The rigid links are configured to receive the sprocket wheel.

SEE OR SEARCH THIS CLASS, SUBCLASS:

- 159+, for an endless track formed of rigid nonmetallic links.

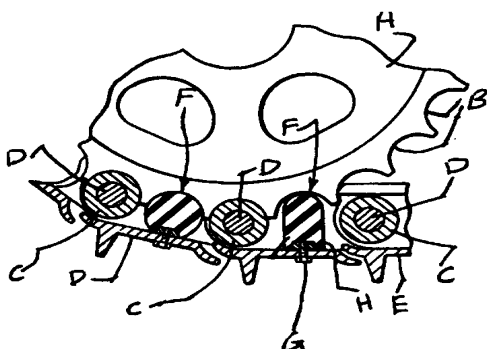
SEE OR SEARCH CLASS:

- 474, Endless Belt Power Transmission Systems or Components, subclasses 155+ for an endless belt formed of rigid links.

197 Having nonmetallic part or component (e.g., at area of engagement):

This subclass is indented under subclass 196. Apparatus including an impact pad or block made of rubber or other elastomeric material to reduce noise, vibration, or wear caused by the engagement of the sprocket and the inflexible components.

- (1) Note. The resilient impact lug reduces track noise and wear due to metal-to-metal impact of the track against the sprocket wheel. The initial contact is made by the lug so that the impact energy is absorbed prior to engagement of the track bushings.



A - Drive sprocket; B - Notches; C - Bushings; D - Track pins; E - Track shoe; F - Nonmetallic part; G - Fastening means; H - Mounting strip

SEE OR SEARCH THIS CLASS, SUB-CLASS:

189, for a detachable grouser for an endless chain track having a nonmetallic part or component.

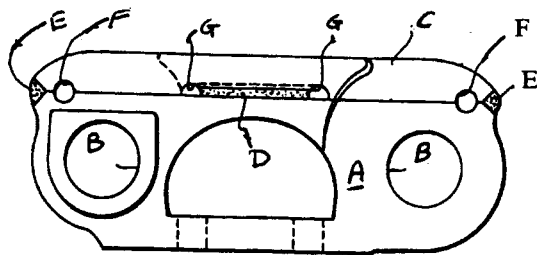
SEE OR SEARCH CLASS:

267, Spring Device, subclasses 292+ for a elastomeric vehicle spring device.

474, Endless Belt Power Transmission Systems or Components, subclass 161 for a positive drive pulley or guide roll having a nonmetallic part; and subclass 207 for a positive drive belt formed of rigid links including a non-metallic part.

198 Link or shoe structure, per se:

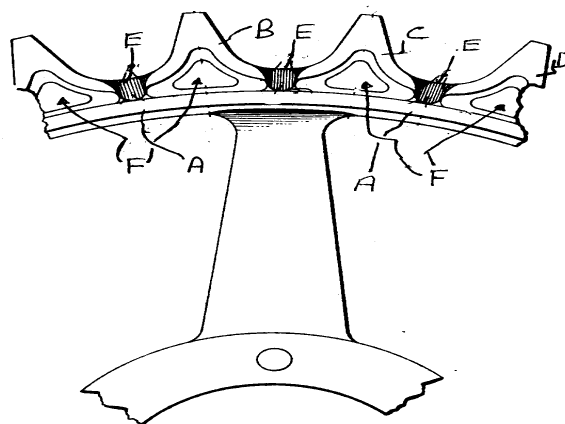
This subclass is indented under subclass 196. Apparatus wherein the significance is attributed to the shape or configuration of the inflexible component or the traction plate.



A - Track line; B - Connector pin bores; C - Removable vail; D, E - Weldments; F, G - Cross bores to avoid stress

199 Sprocket wheel structure, per se:

This subclass is indented under subclass 195. Apparatus wherein the significance is attributed to the shape or configuration of the toothed wheel.



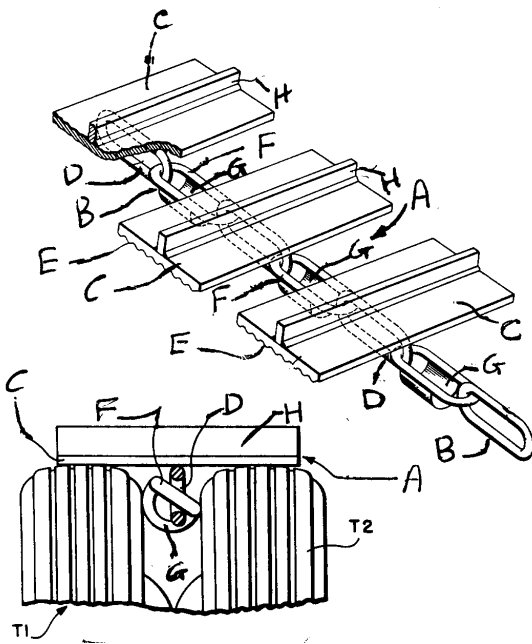
A - Sprocket wheel rim; B, C, D - Wheel teeth; E - Relief or vent openings; F - Openings to reduce weight

SEE OR SEARCH CLASS:

474, Endless Belt Power Transmission Systems or Components, subclasses 152+ for a positive drive pulley or guide roll; subclasses 184+ for a pulley or guide roll having plural, discrete belts; subclass 901 for a pulley or guide roll structure for the track of an endless track vehicle.

200 Track formed of rigid links:

This subclass is indented under subclass 193. Apparatus wherein the continuous band for vehicle having a drive wheel or roller consists of a plurality of individual inflexible components located adjacent to one another and forming a broad band and being held together at short distances from one another by transverse ribs or plates.



A - Endless belt tread; B - Link chain; C - Transverse tread plate; D - Alternate links; E - Grooves for tread plate; F - Connector links; G - Semicylindrical guide members; H - Grouser or projecting cleat; T1, T2 - Drive wheels or drive rollers

SEE OR SEARCH THIS CLASS, SUB-CLASS:

196+, for a sprocket wheel track formed of rigid links.

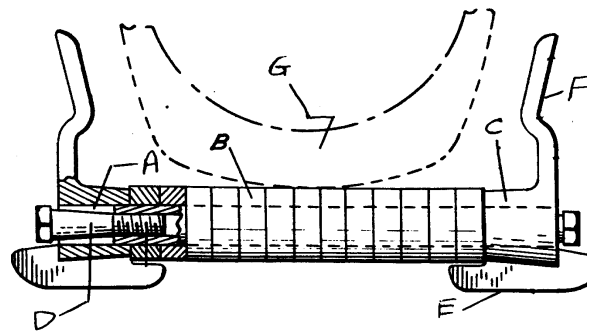
SEE OR SEARCH CLASS:

180, Motor Vehicles, subclass 6.7 for an endless flexible track; and subclass 9.44 for an endless flexible portable track with steering means.

474, Endless Belt Power Transmission Systems or Components, subclasses 155+ for a belt formed of rigid links adapted for a positive drive pulley or guide roll.

201 Link or shoe structure, per se:

This subclass is indented under subclass 200. Apparatus wherein the significance is attributed to the shape or configuration of the inflexible component or the traction plate.



A - Link pin; B - Link; C - Sleeve; D - Threaded plug; E - Shoe; F - Shoe guide; G - Tire or wheel

SEE OR SEARCH THIS CLASS, SUB-CLASS:

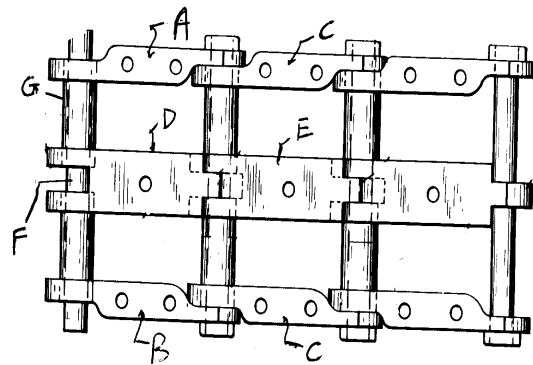
198, for a link or shoe structure.

SEE OR SEARCH CLASS:

59, Chain, Staple and Horseshoe Making, subclass 35.1 for a chain blank and a process of making.

202 Separate transverse connector pin between treads:

This subclass is indented under subclass 185. Apparatus wherein the joint between the track shoes includes a cylindrical element engaging adjacent shoes and extending horizontally to the direction of travel of the track.



A, B, C - (Inside-Outside) Link members; D, E - Intermediate link members; F - Transverse connector pin; G - Sleeve or bushing

SEE OR SEARCH THIS CLASS, SUB-CLASS:

- 42, for track treads provided with rubber torsion bushings for receiving a connector pin.
- 47+, for a flexible track provided with sag prevention means, and wherein the individual treads are interconnected by means of a horizontally extending transverse connector pin.
- 53, for one-piece track treads connected together by means of a separate transverse connector pin.
- 105, and 106, wherein the track treads are interconnected by means of a separate pin and provided with means to seal the connection against the entry of the dirt.
- 118, for a lubrication passage in the pin.
- 164, for rubber treads provided with embedded transverse connector pins receiving bushings.

SEE OR SEARCH CLASS:

- 16, Miscellaneous Hardware, subclass 259 for a discrete retaining means for pivoted contacting surfaces.
- 29, Metal Working, subclass 891.1 for a method of making a part of a traction apparatus.
- 474, Endless Belt Power Transmission Systems or Components, subclass 222 for a rigid link belt including threaded connection between the pin and the locking member; and subclasses 228+ for a discrete connector extending through laterally aligned apertures in adjacent links.

203 Including nonmetallic part or component:

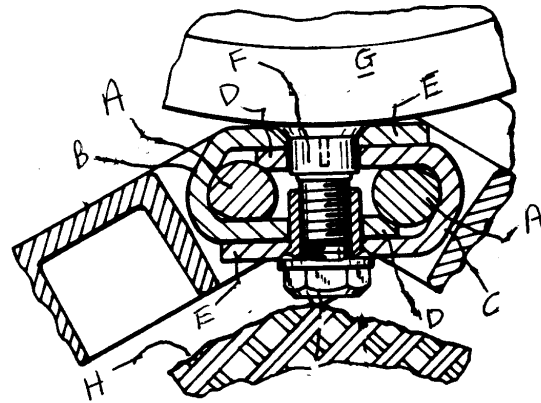
This subclass is indented under subclass 202. Apparatus wherein the cylindrical element includes as a component thereof an element made of an elastomeric material.

SEE OR SEARCH THIS CLASS, SUB-CLASS:

- 42, for track treads provided with rubber torsion bushings.

204 Including additional locking member for retaining link connectors (e.g., pin connectors):

This subclass is indented under subclass 202. Apparatus further including a connecting device such as a clamp for joining adjacent connecting pins.



A -Link connector pin; B, C, D, E - Clamps; F - Locking screw; G - Drive wheel; H - Path of travel

SEE OR SEARCH CLASS:

- 59, Chain, Staple, and Horseshoe Making, subclass 7 for sprocket chain link assembling.
- 403, Joints and Connections, subclasses 345+ for various interfitted members, especially subclasses 373+ for clamped members.
- 474, Endless Belt Power Transmission Systems or Components, subclasses 220+ wherein the common locking member retains longitudinally spaced connectors.

CROSS-REFERENCE ART COLLECTIONS

900 MASTER LINK:

Cross reference art collection drawn to links used to join the free ends of, and thereby complete the formation of, an endless track.

END